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MEDICINE.

FURTHER RESEARCH IN THE TREATMENT OF HYPERTENSION.

THORNE, L. T. (*Practitioner*, May, 1920) discusses the general subject of hypertension and concludes as follows:

1. In cases of hypertension, whether sclerotic or presclerotic the blood-pressure is always lowered by immersion in a "Nauheim" bath, whether the bath is of the *still* or *effervescent* variety.
2. Even an advanced condition of arterio-sclerosis does not counter-indicate the treatment.
3. All cases of hypertension, whether sclerotic or pre-sclerotic, derive great benefit from a properly administered course of "Nauheim" baths.
4. The "Nauheim" baths are useful, not only for the treatment of hypertensions and arterio-sclerosis, but cases of sclerotic and pre-sclerotic hypertension can be differentiated by the effect of the baths upon their blood-pressure, for this effect differs materially according to the condition of the vessel walls.

[J. B. H.]

MODERN OUTLOOK ON THE TREATMENT OF TUBERCULOSIS.

PHILIP, R. (*Edinburgh Med. Jour.*, July, 1920), in an article which is difficult to review but which is, nevertheless, well worth careful perusal, discusses the general status of the tuberculosis problem at the present time and the outlook for the future. He comments particularly upon the present hopeful attitude considering the curability of tuberculosis as shown by the fact that more persons recover than ultimately die from this disease.

The traditional portraiture of phthisis by Hippocrates and later masters in clinical medicine has so commanded attention as in some ways to constitute a bar to the recognition of the early stages of this disease.

He objects, and rightly, to the term "pre-tuberculous." He likewise calls attention to the striking analogy between tuberculosis and syphilis. The primary lesion in tuberculosis is often impossible to find owing to the fact that the organism passes through the normal, healthy mucous membrane, leaving no trace. Following this, there succeeds a period of latency, again followed by lymphatic involvement. He emphasizes the importance of systemic intoxication in the diagnosis of this condition. In the future, he believes that not only will there be a decrease in the death rate, but that, of greater importance, there will be a lessened morbidity. [J. B. H.]

SYPHILIS OF THE KIDNEY.

THOMPSON, L. (*Jour. A. M. A.*, July 3, 1920), after stating that few text-books but Cabot's work on Modern Urology give any information on the subject, draws the clinical picture as far as possible. Symptoms are not characteristic and are often difficult to differentiate from other acute or chronic affections of the kidney. The disease affects the kidney in only about three per cent. of all syphilitics, according to Osler. [E. H. R.]

(Continued on page vi.)

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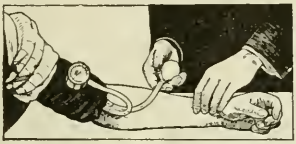

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(Continued from page iv.)

The Heart in Graves's Disease.

Goodall, J. S. (*Practitioner*, July, 1920), discussing the heart in Graves's disease, calls attention to the importance of an accurate knowledge of the heart in Graves's disease because in every case the heart is affected to a certain extent, while in unrelieved Graves's disease the termination is death by cardiac failure and the state of the cardiovascular system determines not only the possibility or otherwise of any operative procedure on the thyroid gland but the nature and extent of such an operation.

The actual extent of the cardiac involvement depends on three main factors: (1) the duration of the disease; (2) the intensity of the intoxication; (3) the pre-existing state of the heart.

The changes the heart undergoes in Graves's disease are:

(*a*) Tachycardia—120 to 200 per minute, leading to

(*b*) Myocardial exhaustion—associated with

(*c*) Atonia—with relative valve incompetence.

(*d*) Dilatation—cardiac dulness increased. Apex beat outside nipple line. Epigastric pulsation. Pericardial basal rub. Pain. Continuous valve incompetence.

(*e*) Myocardial degeneration—long-standing cases chiefly. Impaired conductivity.

(*f*) Auricular fibrillation—cardiac failure. Death.

He discusses the treatment of these various complications. [J. B. H.]

Renal Glycosuria.

Paullin, J. E. (*Jour. A. M. A.*, July 24, 1920) believes that it is fairly well established that this is a condition in which the kidney is abnormally permeable to glucose. The exact nature, cause, and the factors determining this permeability are little understood. Many of the cases show varying degrees of permeability. Few of the patients have been observed for a sufficient length of time to determine definitely whether they develop a true diabetes mellitus or not, although it would seem that such does not occur and the existence of the condition is not incompatible with a normal existence. A case observed over four years has shown no progress downward. [E. H. R.]

The Therapeutic Use of Oxygen.

Rudolf, R. D. (*Am. Jour. Med. Sci.*, July, 1920 draws the following conclusions:

1. Oxygen is of value whenever a state of anoxemia exists. This is universally recognized in cases of mountain sickness and sickness from high flying, and in poisoning by CO, nitrites and arseniuretted hydrogen and also in the effects of enemy gas.

2. For the same reasons oxygen should be tried in all cases of cyanosis, and also in acute respiratory conditions, such as pneumonia, when anoxemia threatens.

3. The ordinary method of giving oxygen by holding a funnel connected with the oxygen cylinder near the face of the patient is practically useless.

4. A better method than this is to give the gas through a rubber tube inserted into one nostril, and this may be made more effectual if the opposite nostril be rhythmically compressed during inspiration, the mouth, of course, being kept closed.

5. The oxygen chamber is a very effectual way of giving oxygen, especially in chronic cases, but it involves much expense and care.

6. An extremely useful and effectual appliance for the administration of oxygen is Meltzer's apparatus for oral insufflation. [E. H. R.]

(Continued on page viii.)

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(Continued from page vi.)

SYMPOSIUM ON THYROID DISEASE.

FOUR articles by DRS. MASON, LAHEY, EASTMAN, AND BARTLETT (*Jour. A. M. A.*, July 19, 1920) form a very valuable contribution to our ideas of the surgical treatment of this condition. Mason states in regard to the exophthalmic type that the ideal time for operation is within the first six months. The closer we get to the high wave of toxicity, the higher is the mortality and the larger the number of incomplete cases. The patient operated on before the first crisis is eventually much better off than the one who is carried to and then through the crisis by medical treatment and operated on later. He then discusses his new method of destroying the thyroid tissue by the use of the hot electric cautery knife introduced through a small incision and under local anesthesia.

Lahey's article is devoted largely to a discussion of intrathoracic goiters and is a practical contribution. Eastman discusses the advantages of local anesthesia in thyroid surgery and Bartlett describes the new lateral emergency incision for removal of the gland. [E. H. R.]

CLINICAL EXPERIENCE WITH A STANDARDIZED DRIED AQUEOUS EXTRACT OF DIGITALIS.

NEST, H. F., AND PRATT, J. H. (*Jour. A. M. A.*, July 19, 1920) report the results of their most interesting and practical work on dried digitalis. The details of the article are too great for abstracting, but the work is of much interest and practical value to the internist. [E. H. R.]

PATHOLOGY.

RESULT OF THE EXPOSURE OF ANIMAL OVARIES TO THE RAYS OF RADIUM.

MAURAY, J. M. (*Jour. A. M. A.*, June 19, 1920) draws the following conclusions from his work:

Two other animals which had become pregnant were later treated and did not miscarry, indicating that the membrana granulosa of the mature follicles, from which the corpus luteum cells are probably formed, was not degenerated; for it is well known that if the corpus luteum of pregnancy is destroyed in its early stages, the fetus will be cast off.

From these results I think it a fair deduction that a 600 mg. hour dosage of radium does not produce degeneration of the follicles of the ovaries.

[E. H. R.]

STUDIES ON CALCIUM AND MAGNESIUM METABOLISM IN DISEASE.

UNDERHILL, F. P., ET AL. (*Jour. of Exp. Med.*, July, 1920).

In leprosy there is a definite retention of calcium.

The more advanced the stage of the disease the greater is the degree of retention.

This behavior on the part of leprous individuals may be taken as an indication that the organism is in need of calcium.

Magnesium may also be retained in leprosy, but the degree of retention is much less marked than in the case of calcium.

With the exception of the retention of calcium and magnesium, the leprous organism responds to changes in the intake of calcium and magnesium in the same manner as normal individuals.

The results of this investigation suggest that in leprosy administration of calcium may be of benefit as an additional therapeutic measure in an endeavor to retard or arrest the progress of the bone changes characteristic of the disease. [E. H. R.]

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Give one to three ounces every hour or two, according to the age of the baby, continuing until stools lessen in number and improve in character.

Milk, preferably skimmed, may then be substituted for water—one ounce each day—until regular proportions of milk and water, adapted to the age of the baby, are reached.

The Boston Medical and Surgical Journal

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Original Articles.

THE PHENOLSULPHONEPHTHALEIN TEST AND THE NON-PROTEIN NITROGEN OF THE BLOOD IN CHRONIC NEPHRITIS.*

BY REGINALD FITZ, M.D., BOSTON,

Associate in Medicine, Massachusetts General Hospital.

DURING the last few years the importance of special laboratory tests for various diseases has been so greatly emphasized in medical literature that it is desirable for the general practitioner to have the practical limitations of such methods sharply defined. This paper discusses the phenolsulphonephthalein test and the non-protein nitrogen or urea concentration of the blood in the diagnosis, prognosis and treatment of chronic nephritis. These tests are selected for discussion because they are being generally used in this hospital and many other places and not because they are necessarily the best or the most comprehensive.

THE PHENOLSULPHONEPHTHALEIN TEST AND THE NON-PROTEIN NITROGEN OF THE BLOOD IN THE DIAGNOSIS OF CHRONIC NEPHRITIS.

The case records of the Massachusetts General Hospital[1] show that chronic nephritis was found in 90 autopsies performed there between 1914-1919. All but seven of these cases pathologically were of chronic glomerulonephritis or of arteriosclerotic nephritis. The remaining were cases of a mixture of these two types of nephritis or were of various atypical and obscure forms which are so rare as to be negligible. The essential lesions in the two common types of disease were found in the glomeruli or in the smaller renal vessels. Both types showed such characteristic gross and microscopic appearances that an anatomical distinction was made in all cases except the few in which one of these types of nephritis was superimposed upon the other.

The records of fifteen cases of chronic glomerulonephritis and of twenty-six cases of arteriosclerotic nephritis which had been studied during life by one or more phenolsulphonephthalein tests and blood nitrogen determinations were selected from this material for closer analysis. The records of these cases did not suggest any definite relationship between the type of nephritis found at autopsy and the results of these two tests for kidney function made during life nor did they show any close relationship between the amount of gross anatomical destruction of the kidney and the apparent degree of impairment of renal function. These observations confirm Frothingham,[2] who

* Presented in part at the Massachusetts General Hospital on March 17, 1920.

was unable to correlate anatomical and clinical findings from a more elaborate study of the nephritic material of the Peter Bent Brigham Hospital in 1916, and Stengel, Austin, and Jonas,[3] who reported cases from the Hospital of the University of Pennsylvania in 1918. The conclusion therefore is justifiable that these tests do not help in establishing the diagnosis of any type of nephritis based upon underlying pathological anatomy.

Moreover, the phenolsulphonephthalein test and the non-protein concentration of the blood are not of significant value in the diagnosis of early chronic nephritis before characteristic physical signs and symptoms have developed. When either test is sufficiently abnormal to be positive it is usually accompanied by a fairly definite train of physical signs. When both tests are negative in the presence of outspoken symptoms of chronic nephritis, it is not justifiable to assume that no kidney lesion exists. Certainly a better idea of the underlying pathological process in the cases of this series was obtained by the history, routine physical examination and urinalysis than by attempting to interpret the recorded results of the functional tests which were made.

TABLE I.

CHRONIC GLOMERULO NEPHRITIS.

No.	Age	Duration of Symptoms	Stay in Hospital	Cardiac Hypertrophy	B. P. +150 m.m.	Edema	Eye-Grounds	Urine: Sediment	Urine: Sp. G.
1	35	5 months	5 months	Yes	Yes	No	Retinitis	Casts	1005-15
2	32	8 years	1 week	Yes	Yes	No	Retinitis	Casts	1010
3	40	6 months	5 days	Yes	Yes	Yes	———	Casts	1015
4	38	6 months	1 day	Yes	No	No	———	Blood, Leucs.	1012
5	34	5 months	2 weeks	Yes	Yes	No	———	Blood, Leucs.	1008-14
6	33	9 months	1 month	No	Yes	No	Retinitis	Blood, Leucs., Casts	1006-24
7	31	1 year	14 days	Yes	Yes	No	Retinitis	Blood, Casts	1010-04
8	30	3 months	6 weeks	Yes	No	Yes	Negative	Blood, Leucs., Casts	1012-30
9	27	3 years	3 days	No	Yes	No	———	Blood	1012-16
10	29	3 weeks	9 weeks	——	Yes	No	Retinitis	Casts	1007-12
11	30	6 years	3 weeks	Yes	Yes	Yes	———	Blood, Casts	1008-18
12	27	11 years	16 days	Yes	Yes	No	Retinitis	Blood, Leucs., Casts	1008-12
13	23	?	12 days	Yes	Yes	No	Edema	Blood, Leucs.	1016
14	26	11 days	6 days	Yes	Yes	No	Negative	Blood, Leucs.	1012-17
15	29	5 weeks	3 weeks	No	Yes	No	Retinitis	Leucs.	1008-10

Average age	32 yrs.	Eye-ground changes	80%
Average duration	2¼ yrs.	Casts	62½%
Cardiac hypertrophy	75%	Blood	60%
Hypertension	87½%	Leucocytes	14%
Edema	19%		

All these cases had varying amts of albuminuria.

Chronic glomerulonephritis as judged by these cases is a disease of young people. It tends to run a long, slow course, but in many cases does not cause appreciable symptoms until a relatively short time before death. It is usually accompanied by the physical signs of cardiac hypertrophy and hypertension and often by albuminuric retinitis. Oedema may or may not be present. The urine always has albumin in varying amounts, and is usually of low specific gravity. The sediment contains blood commonly, casts often and leucocytes less frequently.

Arteriosclerotic nephritis, in contrast, is a disease of old people, although it may be found in the young. In other respects it is much like chronic glomerulonephritis. It runs a long, slow course. It is generally accompanied by the physical signs of cardiac hypertrophy and hypertension and often by albuminuric retinitis. Oedema may or may not be present. The urine always has albumin and is usually of low specific gravity. The sediment, as opposed to chronic glomerulonephritis, contains casts commonly, blood often, and leucocytes occasionally.

On the whole, chronic nephritis in young

Arterio-Sclerotic Nephritis.

No.	Age	Duration of Symptoms	Stay in Hospital	Cardiac Hypertrophy	B. P. +150 M.M.	Edema	Eye-Grounds	Urine: Sediment	Urine: Sp. G.
1	55	Months	2 weeks	None	...	Yes	Hemorrhage and Retinitis	Blood, Leucs., Casts	1000-18
2	58	1½ years	32 days	Yes	Yes	No	Hemorrhage and Exudate	Leucs., Casts	1006-14
3	57	7 months	1 week	Yes	Yes	Yes	Negative	Blood, Leucs., Casts	1014
4	68	8 months	7 weeks	None	No	Yes	———	Casts	1005-12
5	57	6 months	8 days	None	Yes	No	———	Leucs.	1007-10
6	45	6 months	7 days	Yes	Yes	Yes	Arterio-scl. Retinitis	Blood, Leucs., Casts	1010-12
7	56	2 years	10 days	None	Yes	Yes	———	Leucs., Casts	1012-14
8	81	?	4 days	?	Yes	Yes	———	Casts, Blood	1020
9	56	3 years	16 days	Yes	Yes	Yes	Hemorrhage	Casts	1010-26
10	69	2½ years	3 weeks	Yes	Yes	Yes	Hemorrhage	Casts	1010-30
11	62	10 months	5 days	Yes	Yes	Yes	Negative	Leucs., Casts	1010-18
12	65	15 years	9 days	None	Yes	No	———	Blood, Casts	1010-12
13	38	2½ years	11 days	None	Yes	No	———	Blood, Leucs.	1008-16
14	46	1 year	17 days	None	Yes	Yes	Hemorrhage and Exudate	Casts	1006-10
15	37	1 year	10 days	Yes	Yes	No	———	Blood	1006-12
16	45	2½ mos.	22 days	Yes	Yes	No	———	Casts, Blood	1006-18
17	47	9 days	6 days	Yes	Yes	Yes	Retinitis	Blood, Casts	1018-13
18	43	6 years	17 days	Yes	Yes	No	Retinitis	Casts	1022
19	45	4 years	8 weeks	Yes	Yes	No	Arterio-scl.	Casts	1006-12
20	44	3 years	3 months	Yes	Yes	No	Hemorrhage	Casts	1015-08
21	53	1½ years	11 days	Yes	Yes	No	Retinitis	Casts	1006-18
22	62	6 weeks	10 days	None	No	Yes	———	Blood	1008-10
23	61	7 weeks	4 weeks	Yes	Yes	No	———	Leucs., Blood	1008-12
24	33	1 week	1 month	None	Yes	No	Retinitis	Casts	1008-14
25	44	9 years	5 weeks	Yes	Yes	Yes	Arterio-scl. Hemorrhage	Casts	1010-12
26	46	3 years	10 days	None	Yes	No	Retinitis	Leucs.	1006-12

Average age	52 yrs.	Edema	46%
Average duration	2½ yrs.	Eye-ground changes	87.5%
Cardiac hypertrophy	61%	Blood	46%
Hypertension	92%	Leukocytes	26%

All these cases had varying amounts of albuminuria.

people at autopsy is usually of the glomerular type, although it may be arteriosclerotic, while chronic nephritis in people above forty is almost always of the arteriosclerotic type. Both diseases are chronic and tend to be accompanied by cardiac hypertrophy, increased blood pressure, eye-ground changes and by a urine which contains albumin and of which the sediment has renal elements. This combination of physical signs justifies the diagnosis of chronic nephritis regardless of what the phenolsulphonephthalein test and the blood nitrogen concentration may be. Cases with histories suggesting chronic nephritis but without the physical signs should be studied most carefully and other less common types of the disease should be excluded, such as amyloid nephritis, lesions due to calculi, or tumor, or to subacute glomerulonephritis without hypertension or cardiac hypertrophy but with oedema and albuminuria. The phenolsulphonephthalein test and the non-protein nitrogen concentration of the blood do not determine the type of kidney lesion nor the existence of any kidney lesion before characteristic physical signs have developed. Their value in the diagnosis of chronic nephritis is secondary to that of ordinary clinical methods.

The Phenolsulphonephthalein Test and the Non-Protein Nitrogen of the Blood in the Prognosis of Chronic Nephritis.

Considerable stress has been laid by various writers upon the prognostic value of the phenolsulphonephthalein test and the concen-

tration of the non-protein nitrogen of the blood in chronic nephritis. In most cases, as death approaches, the capability for elimination of phenolsulphonephthalein diminishes and the non-protein nitrogen of the blood increases. Frissell and Vogel[4] have gone so far as to suggest that by plotting the course of a very long series of cases it might be possible to arrive at an average expectation of life as indicated by these tests from any individual determination. Until a large amount of carefully controlled data has been collected to establish this point one must remember that many nephritis cases with atypical function have been reported and that in most cases the phenolsulphonephthalein test or the non-protein nitrogen concentration of the blood have not offered immediate prognostic information which could not be obtained by simpler ways. The cause of uraemia is still undiscovered but certainly does not depend upon so-called nitrogen retention, and nephritis cases, besides dying of uraemia, commonly die of intercurrent infection or of some cardiovascular complication which cannot be predicted. Even cases of pure nephritis, such as those reported by O'Hare,[5] with fatal outcome in uraemia may live for several years with remarkably low renal function as judged by laboratory tests. The following table from this hospital of fourteen fatal cases in which the phenolsulphonephthalein test and non-protein nitrogen concentration of the blood were made at the same time, helps to illustrate the possible lack of immediate prognostic information obtained by these methods.

TABLE II.

CASE NO.	PHENOLSULPHONEPHTHALEIN EXCRETION IN 2 HOURS	NON-PROTEIN NITROGEN OF BLOOD M.M. PER 100 C.C.	DAYS BEFORE DEATH
1	20%	50	5
2	20%	36	14
3	20%	28	21
4	10%	66	75
5	5%	125	5
6	5%	71	4
7	5%	66	21
8	5%	56	2
9	0%	220	9
10	0%	204	7
11	0%	200	5
12	0%	132	2
13	0%	82	6
14	0%	52	9

As can be seen, three cases with a phenolsulphonephthalein excretion of 20% lived between five days and three weeks, and the non-protein nitrogen concentration of the blood in these cases varied between 28-50 mgm. per 100 cc. One case with a phenolsulphonephthalein excretion of 10% lived for two and one-half months with a non-protein nitrogen concentration in the blood of 66 mgm. per 100 cc. Four cases with 5% phenolsulphonephthalein excretion lived between two days and three weeks, the case with the lowest non-protein nitrogen concentration in the blood dying the soonest. Six cases with a zero phenolsulphonephthalein excretion lived between two and nine days. The blood nitrogen concentration in these cases varied between 52 and 220 mgms. per 100 cc., the case with the highest blood nitrogen concentration being one of the two which lived the longest.

Therefore at present the value of a single phenolsulphonephthalein test or blood nitrogen figure in the prognosis of chronic nephritis is less than the value of careful clinical study, and while of importance in affording evidence confirmatory to clinical observation is of secondary interest.

THE PHENOLSULPHONEPHTHALEIN TEST AND THE NON-PROTEIN NITROGEN OF THE BLOOD IN THE TREATMENT OF CHRONIC NEPHRITIS.

The phenolsulphonephthalein test and the non-protein nitrogen concentration of the blood may become of great value in following the course of a chronic nephritis and the results of treatment. In this relation, however, they must not be considered as tests for kidney function so much as methods for studying certain phases of the pathological physiology of the kidney under given conditions. Their results must be correlated with the patient's history, physical examination and condition, and must be repeatedly observed over a long period of time.

The phenolsulphonephthalein test is so easy to perform that its simplicity opens up various chances of error. Animal experiments and clinical observations have established the fact that the amount of dye excreted in the urine after its intramuscular or intravenous injection bears a direct relation to renal function at the time the test is made. In performing the test repeatedly all conditions which can be regulated must be kept as constant as possible. The same amount of dye accurately measured must be injected into the same muscle or vein at each repetition of the test. The length of time for the test must be measured and kept constant. The same amount of fluid used to insure a flow of urine must be given at the same time before

each test is begun. The greatest eare must be taken in collecting specimens, and in making colorimetric readings. Unless all these factors are controlled critically, the results from the test in repeated observations are vitiated.

Nitrogen retention in its proper sense implies that the nitrogen output in the urine is less than the nitrogen intake in the food as a result of which there is a continuous positive nitrogen balance with a constantly increasing amount of nitrogen held back in the blood by damaged kidneys. In actual use, the term has come to be applied to any condition associated with an increased concentration of nitrogen in the blood without reference to nitrogen balance and the finding of a blood nitrogen concentration higher than the average normal has been called nitrogen retention and has been taken to indicate disturbed renal function.

In most cases of nephritis, until shortly before death, an increased blood nitrogen concentration is not due to a continuous process of piling up nitrogen in the body owing to the inability of the kidneys to exerete the nitrogen formed in metabolism. This has been demonstrated by Widal,[6] McLean,[7] and others, who have shown that the nephritic individual tends to keep in nitrogen equilibrium just as does the normal. If the nitrogen intake in the diet is increased, the nitrogen output in the urine is increased and if the nitrogen intake is diminished so is the nitrogen output. In a normal individual who is given a high protein diet, the blood nitrogen concentration becomes abnormally high and diminishes as the nitrogen intake is diminished. The nephritic patient reacts in identical fashion, differing from the normal in degree only.

This phenomenon led Ambard[8] to work out his "constant" and McLean his "Urea Index," both being formulae designed to express in mathematical terms the relationship between the concentration of urea in the blood and the rate of urea excretion in the urine at a given time. By employing the constant or the urea index, it is possible to demonstrate abnormalities in kidney function which are overlooked by blood analysis alone. Therefore in interpreting the blood nitrogen concentration most intelligently it is important to know the nitrogen intake in the diet at the time the test is made, as well as the nitrogen excretion in the urine, and it is preferable to use either Ambard's constant or the urea index rather than the blood nitrogen figure alone.

Two cases are demonstrated to illustrate the importance of this fact.

The first patient (E.M., No. 2347998) was a man 29 years old who entered the hospital January 25, 1920, with erythema multiforme. After being in the hospital for a few days he developed signs of acute nephritis accompanied by increased blood pressure, hematuria, and oliguria. He was given a diet containing each day about 9 gms. of nitrogen and 3 gms. of sodium chloride. His blood and urine were analyzed quantitatively at weekly intervals and showed the following results which have been recorded graphically:

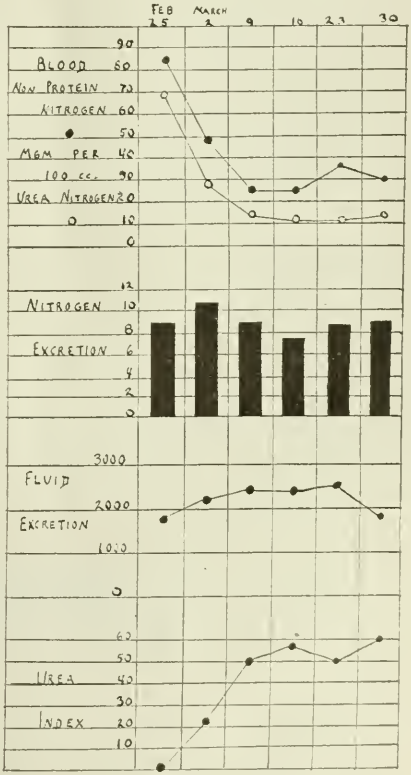

Chart 1.

As the nitrogen excretion was approximately the same on each of six examinations and corresponded closly to the nitrogen intake in the diet, true nitrogen retention did not exist. At

the first observation of the blood non-protein nitrogen and urea nitrogen were markedly increased, quickly falling to within normal limits. From the last examination of the blood alone one might naturally conclude that the nephritis had become quiescent.

The urea index, however, which at first was very low, showed a rapid initial rise but remained stationary on the four last examinations and was still below the average normal of 80. This, coupled with the facts that the man was losing weight steadily and that his urine continued to show albumin, blood and casts, suggested that his nephritis was not healed and that his blood analyses alone meant relatively little. The urea nitrogen and total non-protein nitrogen figures were within normal limits because of the low protein intake of the diet. Relatively, both were abnormally high.

The second case (W. M., No. 234964) was a

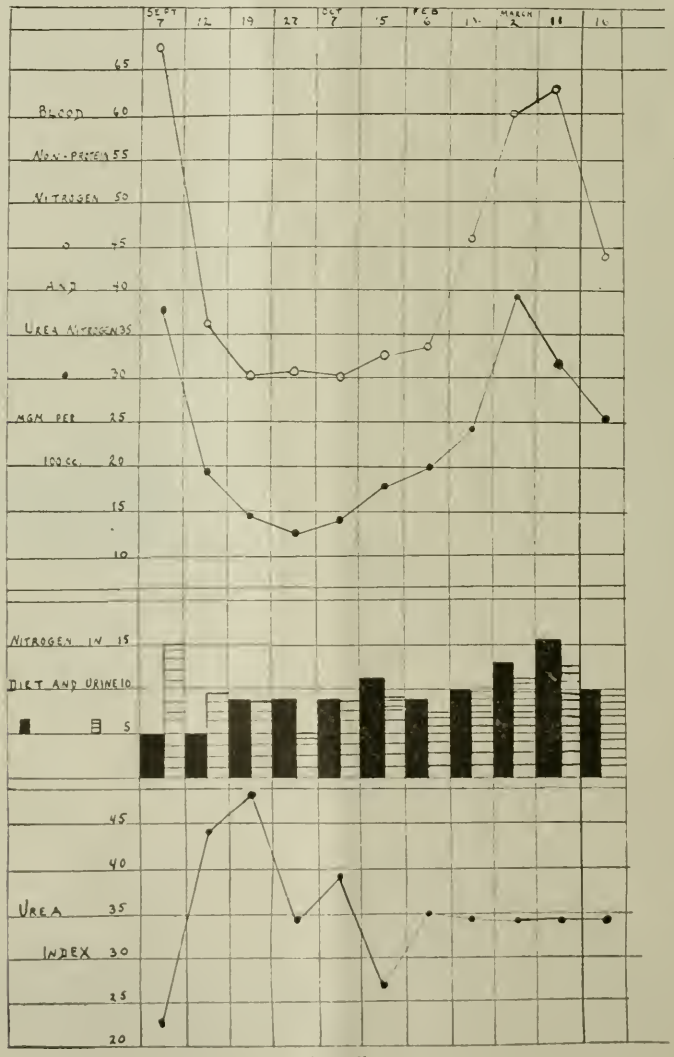

Chart II.

man 55 years old, who entered the hospital on September 7, 1919. He had diabetes complicated by arteriosclerosis, cardiac hypertrophy, and dilatation, arteriosclerotic nephritis with hypertension, albuminuria, and cylindruria. His urine and blood were analyzed at intervals, the essential data being charted below.

The most striking feature of this chart are the variations encountered in the blood non-protein and urea nitrogen curves. At first, there was an elevation of both which soon dropped to within normal limits, then rose to a considerable degree and finally dropped again to a low figure. These differences are not due to changes in renal function as the blood figures suggest, but are due to variation in the nitrogen intake of the diet. At first the patient was given a low protein diet which was gradually increased. On the first two observations the nitrogen excretion was in excess of the intake, suggesting reaction from true nitrogen retention. After a few days, however, the patient came into nitrogen equilibrium and remained so during the remaining period of observation. As the protein intake and nitrogen output increased, the non-protein nitrogen and urea nitrogen in the blood increased, until finally the nitrogen intake and output were again diminished when there was a simultaneous drop in the blood figures. Renal function as judged by the urea index was nearly constant in eight out of the eleven tests. At first it was low, possibly due to superimposed chronic passive congestion, and for two observations following was increased. Subsequently it remained at almost a fixed level.

In other words, the non-protein nitrogen of the blood was varied by dietetic changes and not by nitrogen retention. Relatively, the degree of accumulation of nitrogen in the blood remained constant although the actual figures of the blood nitrogen were between 30 and 63 mgm. per 100 cc. Renal function was no better when the blood nitrogen was normal than when it was increased.

The traditional treatment of chronic nephritis is designed to lessen the load thrown upon damaged kidneys by the excretion of waste products. This is usually attempted in the first instance by restriction of diet. It has been assumed that cases with a normal blood nitrogen concentration are in better condition than cases with a high blood nitrogen concentration, and therefore some form of restricted protein diet has been employed to keep the blood nitrogen figure within normal limits. But no evidence has been produced to prove that a low protein diet and a normal blood nitrogen concentration actually improve the degree of nephritis, while the recent work of Epstein[9] suggests that a high protein diet may be beneficial under certain conditions.

There is unquestionably some relationship in many cases of chronic nephritis between oedema and sodium chloride retention. Therefore a restricted salt diet is often prescribed. The underlying pathological physiology of oedema is, however, by no means clear and there is no proof that the mechanical presence of oedema increases the degree of nephritis or the degree of renal insufficiency.

Purgation, sweating, and bleeding are three measures which have been used in the treatment of chronic nephritis for many years. No critical study of the way in which these methods can be used to best advantage has been reported. On the whole, the present treatment of chronic nephritis is empirical. Such tests as the phenolsulphonephthalein test and Ambard's constant or the urea index offer methods by which various phases of the disease can be studied as problems in pathological physiology. By repeating such tests when they are properly controlled under different forms of diet or other therapeutic measures, it is possible to measure the progress of the disease under varying circumstances in more or less quantitative fashion and to assemble facts from an individual case which in future may make its treatment logical and systematic.

CONCLUSIONS.

The phenolsulphonephthalein test and the non-protein nitrogen concentration of the blood are two tests for kidney function which are being generally used for the diagnosis, prognosis, and treatment of chronic nephritis.

These tests are not of obvious value in the diagnosis of chronic nephritis as they do not point out the presence of any specific pathological type of lesion in the kidney and as they do not demonstrate the presence of kidney disease in the absence of common physical signs.

From a pathological point of view, there are two common types of chronic nephritis. The essential lesions of chronic glomerulonephritis are found in the glomeruli and of arterio-

sclerotic nephritis in the smaller renal vessels. Clinically both types of chronic nephritis are usually associated with cardiac hypertrophy, increased blood pressure and eye-ground changes, and with a urine which contains albumin, blood casts, or leucocytes. Both types of disease are chronic, and slowly progressive. Chronic glomerulonephritis is a disease of young people. Arteriosclerotic nephritis may occur in young people but is more often found in older people. The clinical differentiation of these types does not depend upon studies in renal function but upon careful history taking and routine physical examination.

As the lesions of chronic nephritis advance, the phenolsulphonephthalein excretion diminishes and the non-protein nitrogen concentration of the blood increases. At present, however, a single observation with these tests gives less prognostic information than does careful clinical examination.

The present treatment of chronic nephritis is largely empirical. The phenolsulphonephthalein test and the non-protein nitrogen concentration of the blood offer means by which physiological methods may be applied to the clinical study of individual cases. Unless the technique of these tests is properly controlled, the interpretation of their results is of little value. When these tests are properly performed, however, they can be used to assemble facts from an individual case which measure the progress of the disease in more or less quantitative fashion, and which make possible the establishment of a logical and systematic form of treatment.

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CHRONIC INTESTINAL INDIGESTION IN CHILDREN OVER ONE YEAR OLD.*

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INTRODUCTION.

THE peculiarities of diet during the first year of life undoubtedly play a part in the development of the digestive powers of the child, and yet do not always pave the way for the often too sudden and complete transition to a diet widely differing in chemical and physical characteristics immediately following.

The baby's food is simple and liquid; he does not have to prepare it *mechanically* for digestion. Of its component parts, the fats are highly emulsified, and usually from human or cow's milk, whereas later they are not only liquid, as *cream*, but solid, as *butter*, and from many animal and vegetable sources differing considerably in digestibility. The carbohydrates are limited to the universal mammalian *lactose*, rarely other sugars, which require only moderate digestive efforts, whereas later sugars and starches of many kinds, varying greatly in solubility, and requiring a great deal more complex digestive chemistry, enter the diet, and vary in digestibility according to chemical and physical changes brought about by division and cooking. The proteins in the baby's food are those of human and cow's milk, partly soluble and very easy to digest as *whey;* partly insoluble but still readily digestible as *casein*, whereas later, the proteins are from many sources in different forms, as from meat, eggs, and vegetables.

It is, therefore, not only from an academic, but from a practical standpoint, peculiarly fitting to consider the digestive disturbances beginning at the period of greatest dietary revolution, that is, at about one year.

Indigestion is, strictly speaking, the inability to digest. Therefore, the failure to digest any amount of any substance may be spoken of as "indigestion." On the other hand, a small child should not be expected to digest a pound of fat salt pork. Fat salt pork is obviously too great a tax for his powers. A pound of it is too much, therefore, that particular dose should be regarded as overfeeding, both in quality and amount. Similarly, a child would not be expected to digest a quart of pickles, a raw potato, or dried beef. Such food is unsuitable, or improperly prepared, and should be referred to as "indigestible," and a child so abused not referred to as having "indigestion." In other words, the term "indigestion" should be used only when a child fails to digest a normal amount of food of a normal character, suitably prepared. These factors vary, of course, as the child grows older.

In this paper I shall consider only those

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cases which do not digest the average amount of the average kind of suitably prepared foods.

Clinical experience and opinions crystallized from the study of many cases of Chronic Intestinal Indigestion have shown that seldom is more than one component of the food primarily at fault. It has, therefore, been found expedient to consider each component separately, and to speak of "Fat Indigestion," "Carbohydrate Indigestion," and "Protein Indigestion," that is to say, it has become the custom to classify Indigestion according to substance, rather than according to pathology or etiology. This is probably incorrect, but at the present state of our knowledge provides a practical working basis, and as pathological and etiological factors become more clearly developed may be modified to correspond. At present we certainly do not know *why* children do not digest the various food substances; we do not know *what* organs or secretions are at fault; and we do not know *how* they fail to work. All we know is that they *do* fail to work.

FAT.

Chronic Intestinal Indigestion of fat is quite common after the first year. Its cause, or causes are in general not known. From studies of this condition in early life it is reasonable to suppose that some babies are born with a low fat digestion. It is well known that many children stop digesting fat during and after an acute infection, and that long-continued fat overfeeding is often followed by a long-continued inability to digest fat. This suggests that the fat digesting mechanism may become tired out by overwork. It is also a common observation that children with chronic abdominal inflammation, such as Appendicitis and Tubercular Peritonitis, often show a disturbance of fat digestion. In a good many cases a careful history will indicate a reasonably specific event as a possible cause.

The child's appearance is fairly characteristic, usually presenting one or two types. The first evidently has a slight intoxication, too much color, too red cheeks, and too red lips, often mouth pallor, looks feverish, and has little or no appetite. The second is very pale, often bluish, and is extremely flabby. Both types have in common peevishness, irritability, finicky appetite, long-continued stand-still or loss of weight, and irregularity of the stools. A tentative diagnosis is often to be made from the appearance alone, but final diagnosis must rest upon evidence gained from the stools. *The persistent appearance of fat, in excess, over a long period, while the child is on a normal or subnormal fat intake, alone justifies the diagnosis.*

Treatment depends upon several factors. If the child has an obvious focus of infection, that *may* be at fault and should be removed. Surprising changes for the better often take place on removal of diseased tonsils or adenoids, cleaning up an old otitis media, or a chronic appendix. In most cases, however, we are not so fortunate, and must treat the digestion. Inasmuch as there is yet no known way of making a child digest fat, the easiest way to relieve the symptoms is to remove the fat from his diet entirely. When this is done two things happen. First and probably most important, the fat digesting mechanism is rested; second, irritating and possibly poisonous by-products of faulty fat digestion are removed from the intestine, thereby allowing the child to feel better, and probably to be better. It is probable, also, that a serious loss of salts is thereby prevented.

Inasmuch as fat is only one kind of fuel, and inasmuch as the necessary body fats can be manufactured from carbohydrates, its place in the diet is theoretically not indispensable. As a matter of common experience it can be replaced by an equal value of carbohydrates, as sugars and starches, for an indefinite period. Therefore, there is no urgent need of resuming fat for a long time.

Whereas in the treatment of babies, fat starvation may be necessary and advisable for days or weeks only, in the treatment of older children it is often necessary for weeks and months, and in some cases, usually referred to as "historic," years. I am sure that some of these have graduated by age limit from the Pediatrician to the Internist!

In the last several years much work has been done in feeding to these children fats previously uncommon in the pediatrist's dietary, namely, olive oil and other vegetable fats, and animal fats. (Ladd.) Whether these fats are really more digestible, or less poisonous in the intestine, I do not know. I do know that others have obtained, in many cases among babies, results hardly short of marvelous. Most of the older children dislike the taste of these fats and will not take them.

It seems quite reasonable that a very fine emulsion of fat shall be more digestible than a

coarse one. Clinical experience shows that the fat of a milk mixture, run through a homogenizing machine, is slightly more digestible. The difference is slight, but occasionally is all that is needed.

In the main, however, the child should be deprived of fat for a long time, the length of time and completeness of privation to be governed by the general condition, constantly keeping the fat intake so low that *less* than a normal amount appears in the stools.

CARBOHYDRATE WITHOUT FERMENTATION.

The most common of chronic intestinal indigestions is that of Carbohydrates. It presents several phases, which, for purposes of study, I have elected to group as follows:

1. Simple indigestion, *not associated with fermentation.* The cause may usually be discovered by a careful analysis of the child's diet. Infection, however, and lack of chewing or lack of cooking are often factors. A diet too low in protein is often associated.

In a few cases a particular food.—oatmeal in one, carrots in another, wheat in another, etc., fails to be digested. There are no constant uniform symptoms. The diagnosis is made by finding large amounts of starch in the stools of normal children.

The condition is important only in providing circumstances favorable to the development of more serious disturbances in the future. Treatment consists of reducing the total starch intake; finding and eliminating any particular starch not digested; making the food more digestible by fine division and thorough cooking; and by making the child *chew*. This is best done by giving "dry" meals. (If a child cannot wash his food down, he has to chew it!)

Occasionally, sugars are at fault. The characteristic symptom of sugar indigestion, without fermentation, is diarrhea. The stools are acid and quite irritating. Reduction or elimination of sugar results in cessation of the symptoms.

CARBOHYDRATE WITH FERMENTATION.

2. While the above are met with occasionally, carbohydrate indigestion with fermentation is far more common. Inasmuch as it is axiomatic that fermentation is associated with bacterial activity, and inasmuch as it is probable that a number of organisms play a part in fermentation, I have elected to consider this type by groups as follows:—in relation to the organisms found, and to special symptoms associated with the presence of that organism.

a. Associated with simple fermentation.

A large group of organisms act under favorable circumstances upon carbohydrates to produce *gas.* These conditions are found in the child's intestine. Reaction of the intestinal contents and antagonistic bacteria presumably play a part in the extent of their activities. In simple fermentation a fairly characteristic picture is presented. The child is usually under weight; its color is poor, usually sallow; it has a "pot belly" full of gas; usually a large fatty liver; and its skin is pigmented. This pigmentation is characteristic of all cases of carbohydrate indigestion; is most evident on the sides of the neck, on the flanks and on the abdomen. It is not tan, although it looks like it, and it is not racial. The stools are large, spongy, often loose, usually acid, often foamy, occasionally containing bits of mucus, and usually containing much starch, erythrodextrin and cellulose.

Treatment should be aimed at reducing the carbohydrate intake to below normal, and making the carbohydrates given as digestible as possible. The simple, finely divided starches such as white bread, plain crackers, cereal jellies, well-cooked cereals and macaroni, are best. Vegetables should be omitted altogether for weeks, and then tried cautiously. The child's teeth should be put in order and he should be made to chew. The protein intake is usually low and should be increased, both for the general needs of the child and on account of favoring the growth of bacteria antagonistic to fermentative organisms. Experience has shown that the lactic acid bacillus is quite antagonistic to these organisms and that even very young children will take moderate amounts of buttermilk without serious objection. Six or eight ounces daily will usually be of considerable benefit. It is usually unwise to substitute sugars for the starches.

GAS BACILLUS.

b. Associated with special organisms.

Special organisms may produce or be associated with chronic carbohydrate indigestion. Most common of these is the Gas Bacillus. Kendall first called attention to it in this country as one cause of Infectious Diarrhea. In older children the organism is probably always pres-

ent, and in small numbers is not significant, but in children under three its presence is almost always associated with symptoms. These are more severe and last longer than those of the previous type. There is often a story of infectious diarrhea in the past. The pigmentation is present, as in all chronic carbohydrate disturbances, but in addition the skin is yellowish, particularly about the cheeks and ears. These cases have often been treated very carefully for a long time for carbohydrate indigestion without great improvement. In fact, they fail to improve as long as the gas bacillus is present in appreciable numbers. In other words, when the gas bacillus is present they do not digest starch and they have symptoms: when it has been gotten rid of they do digest starch and they do not have symptoms.

Treatment aims at getting rid of the organism. Inasmuch as the organism must have available carbohydrates to live on, it must be starved. This can be done by feeding the patient soluble carbohydrates, such as sugars, which are absorbed high in the intestine, in place of the insoluble starches which remain unchanged quite low in the intestine. Inasmuch as the organisms prefer an acid reaction, the intestinal contents should be made alkaline by means of a high protein diet. This may easily be done by giving large amounts of milk, egg-whites, and meat. It is probable that the intestine with an alkaline reaction and a large amount of protein favors the development of organisms that are hostile to the gas bacillus. Clinical and bacteriological experience has shown that the living lactic acid organisms have a very active antagonistic action upon the gas bacillus. Inasmuch as cultured lactic milk combines a *high protein* value and enormous numbers of lactic acid organisms, large amounts of fat-free lactic acid milk may be given. Experience has shown that without lactic acid bacillus weeks or months of active treatment may not bring about the disappearance of the organism, whereas with it, the gas bacillus may disappear in a few days. Treatment should be kept up for months, however, and *no starch whatever* given as long as the gas bacillus is present in the stools. When the tests have been negative for a week or ten days, simple, well-cooked starches, such as cereal jellies, and plain crackers, may be given very cautiously. Inasmuch as these children often have an associated fat indigestion it is wise to limit the fat intake to amounts that they can comfortably take care of, as shown by repeated examinations of the stools.

It must be borne in mind that when starch is removed from a child's diet and at the same time the fat intake is low, the fuel values of that diet are altogether too low for the child's needs. This is especially true in winter. It is rather hard on the child's protein-digesting mechanism to be required to provide fuel from very greatly increased amounts of protein alone. Therefore, sugars should be used to supplement the total fuel value, and when lactic acid milk is being given, surprisingly large amounts can be used without disturbance. In many cases, it is wise to give a mixture of various sugars, rather than a large amount of any one sugar.

BUTYRIC ACID.

A second type of chronic intestinal indigestion with fermentation is that associated with the production of butyric acid. As yet it is not certain just how this comes about. Butyric acid is essentially derived from the breaking down of fats. This may occur in many chemical reactions, and is often one result of bacterial activity upon mammalian fats. An organism, the Bacillus Butyricus, has, in fact, been named for this specific action on mammalian fats and is normally found in the intestine. *Chemically* speaking, there is no known way of producing fat from starch or other carbohydrates. Nevertheless, many varieties of *bacteria* are known to produce fats from carbohydrates.

These cases are very rare and present characteristic symptoms. Physically, children with this type of indigestion are much under weight and undersized; are very thin and flabby; are not so much peevish and irritable as whining with seeming discomfort. They have a peculiar bluish, waxen color and do not have as much pigmentation proportionate to the severity of the condition as would be expected. They have enormous abdomens with much gas and intestinal fluid. They have repeated upsets, characterized by vomiting and diarrhea, occasionally fever, which are rather more severe than those seen in other types of indigestion. They have usually been treated for a long time by competent men as cases of chronic fat indigestion and intolerance.

In the five cases that I have seen at the time of an acute upset, the children were so

critically ill, and their bellies were so full of fluid, that I made a diagnosis of severe Tubercular Peritonitis, at my first visit. In one case, I gave that as an unqualified diagnosis and told the parents that the child would die in a few days of general Tuberculosis. (She was fat and rosy in two months!) The most characteristic evidence lies, however, in the stools. When the child is not acutely upset there are three or more, daily, large, spongy stools, with large amounts of food relics, considerable fat, and smelling moderately of butyric acid. During an acute attack, the stools are eight or ten a day, large in amount, watery or spongy, intensely acid, and contain all food elements in large excess. The two most characteristic features are the presence of butyric acid, as shown by the *odor of vomit*, and fat, *greater in amount than is consistent with the fat intake.*

Just where this fat comes from is not clear. It is reasonable to suppose that when a child, whose fat intake is limited to the fat in "separator" milk and the tiny amount occurring in starch, persistently shows considerable fat in the stools, that fat is produced as a result of chemical or bacteriological action in the intestine. It is possible, however, that the fat is derived from the intestines themselves. Chemically speaking, it is impossible to produce butyric acid from starch, yet if we assume that *fat* is formed from *starch*, the production of butyric acid is accounted for. The fact that cases of ordinary fat indigestion do not show butyric acid in the stools invites the speculation as to whether organisms are not able to attack fat in the process of formation in the intestine more readily than preformed fat. These points, however, are for future study to determine.

Treatment is ridiculously simple. It consists of withholding all starch for an indefinite period, and replacing the starch with sugars. Inasmuch as all of these cases that I have seen have been previously treated for a long time for fat indigestion, I have gone very slowly in resuming fat. I have been constantly surprised to find that each case had a normal fat digestion only a few months after omitting starch. As there are general grounds for considering this condition a result of bacterial activity, of the carbohydrate fermenting groups, it has been my custom to give buttermilk on general principles. Whether that has anything to do with their improvement, I do not know. They have been so sick and miserable that I have not dared to try to do without it.

PROTEIN.

A rare type of chronic intestinal indigestion in childhood is the chronic inability to handle reasonable amounts of *protein*. In some cases it appears that the child's need for protein is very low; in others, that its ability to utilize vegetable protein is very high, as seen in oriental and tropical races. As seen in the average hospital clinic, however, the ability to handle protein is quite high and disturbances of the protein digestion quite rare.

Other than previous infection, no definite cause has been determined. Symptomatically, these children are rather under par generally, and of small physique. They are universally bad tempered and sleep poorly at night. In the absence of signs of carbohydrate indigestion, they are unique. Diagnosis depends upon the examination of the stools. They are, macroscopically, usually small, very foul or musty in odor, and contain large bean curds which are derived from casein or possibly egg-whites. Occasionally, while normal in appearance, they will be seen to contain, microscopically, large amounts of yellowish, paving-block-shaped particles which are finely divided, undigested casein. It is unusual for these children to show much undigested meat in the stools.

Treatment should consist in reducing the child's protein intake to conform with its lowest possible protein needs, and in making that protein as digestible as possible. Any particular protein, shown to be undigested, such as eggs, certain meats and certain vegetable proteins, should be omitted altogether. In severe cases (not acute), it may be remembered that the soluble protein of cow's milk, whey, is not coagulable and is very digestible. The main objection to whey is, that to get a sufficient quantity of protein from it, a child must take enormous amounts of it. Casein itself may be made considerably more digestible by cooking, which alters its chemistry, so that in the stomach and intestines a finely divided, instead of a large curd is formed. The same result is obtained by the action of lactic acid, which prevents the formation of large, tough curds. The whites of eggs may be rendered considerably more digestible by beating up with orange juice. This theoretically makes an acid albumen which practically prevents the formation

of large egg-white coagula in the stools. The meat should be very finely ground and thoroughly chewed. Theoretically, finely ground raw meat should be more digestible than finely ground cooked meat. I have not been able to note any appreciable difference.

Fats and carbohydrates can usually be given in increased amounts, and inasmuch as carbohydrates act as "protein-sparers," thereby reducing the amount of protein used up, carbohydrates can profitably be increased to the limit of tolerance, as shown by the examination of the stools. In my experience, chronic protein indigestion is not "cured" by reducing the amount of protein in the diet. The condition is apparently more or less permanent.

DEFICIENT SECRETIONS.

In most cases of chronic intestinal indigestion, only one element is at fault, although often a second element is poorly digested as a result or companion of the first. Occasionally, but fortunately rarely, a case is seen in which all the elements fail to be digested in amounts large enough to keep the child going. He does not grow; he often loses weight for long periods, and in spite of most careful study and treatment, he often dies.

The cause is not known. Such cases are seen in infancy and give rise to the feeling that they were born with poorly developed digestions. In the cases seen among older children, there is often a story of severe illness,—quite frequently a long infectious Diarrhea. There are no characteristic physical symptoms, except great underweight and undersize. Careful study of the stools in relation to the diet shows a constant excess of all the elements of foods. It is reasonable to assume that the digestive reagents in these cases are so diminished in amount or quality that they fail to do enough work to satisfy the patient's needs. Therefore, this type of case is referred to as Chronic Intestinal Indigestion of the "Deficient Secretions" type.

Treatment consists in finding and giving the largest amounts of the most digestible foods which can be tolerated by the patient. This means a careful study of the energy- and growth-needs of the child, correlated with frequent examinations of the stools to prevent giving excess, and in bringing into play all the factors of treatment used in the previously described types of indigestion. It usually means giving low fats, high, even very high mixed sugars, and soluble starches, finely divided and chemically changed proteins.

HERTER'S INFANTALISM.

In 1910, Herter of New York described ten cases which he had studied, and called them "Infantalism." The children were underdeveloped, much under weight, and were all right mentally. They presented evidence of great digestive disturbances. Herter described an organism which he found in the stools of all these cases, and called it Bacillus Infantilismus. A careful analysis of his communication would indicate that he had described extreme cases of fat indigestion, of carbohydrate indigestion with fermentation, and possibly of protein indigestion. The existence of B. Infantilismus has not been confirmed by others, and has not stood the test of time.

CHRONIC INTERSTITIAL NEPHRITIS WITH INFANTALISM.

Still another type is very rarely seen, which presents evidence of malnutrition, and in which study reveals various abnormalities of digestion. These are usually called "chronic intestinal indigestion," and treated as such for a long time without material benefit. The blood pressure is found to be very high, and careful examination of the urine reveals a picture strikingly like that of Chronic Interstitial Nephritis in adults. It is probable that their indigestion is secondary to their nephritis.

CONCLUSION.

I have purposely refrained from mentioning the use of medicines or the active digestive substances borrowed from animals. There is nothing more fascinating than to watch starch fade to sugar, and meat disappear, under the action of these digestants in a test tube. There is nothing more disappointing than to see the same old food particles appear in the stools, and the same old symptoms continue, after giving children *ounces* of these digesting substances, even though they are chemically treated so as to be protected from the stomach juices. There is no such high road to success. *Each case must be individualized.* It is probable that all will be somewhat improved upon careful regulation of the diet based upon general principles,—but few will really get well.

While it is unquestioned that the classification attempted is both unscientific and incor-

rect, yet experience has shown that cases grouped and treated as described, do very well in most instances. Treatments are necessarily merely outlined, as each case must be studied in detail from many sides, thereby acquiring a knowledge of each individual's needs in relation to his digestive peculiarities. This means the gradual accumulation of a mass of information gained by careful attention to details over a long period,—and presupposes as requisites to its attainment a working knowledge of metabolism, the physiology of digestion,—the chemistry of stools, and of food values. This is indeed drudgery, but I know of no similar amount of drudgery that gives such a satisfactory reward in the end.

DISLOCATION OF THE CARPAL SCAPHOID.

BY WILLIAM PEARCE COUES, M.D., BOSTON.

ALTHOUGH dislocation of the semilunar bone and fracture of the carpal scaphoid are at the present time well known injuries and much has been written concerning them, yet the traumatic derangements of the carpus as a whole have received but comparatively little attention.

Dislocation of the carpal scaphoid alone, or associated with semilunar dislocation or fracture is one of the rarest of injuries. Though isolated instances of dislocation of all the carpal bones have been recorded, this injury is not mentioned in many of the text-books dealing with fractures and dislocations.

In the recent illuminating article by Jean and Albert Mouchet[1] on "Mechanisme de Traumatism du Poignet" there is much that is interesting in this connection, and reference to scaphoid dislocation is briefly made. These authors quote Destot, Lavoyenne and Gaulier, who speak of certain torsions of the wrist which may produce a subluxation of the scaphoid, or semilunar-scaphoid derangements.

The former authors remark that it is no exaggeration to say that the surgeon generally sees but the lesions at the lower end of the radius, and that the carpus is still an anatomic part which, except in a few instances, is "terra incognita." They aptly say, "An unrecognized fracture of the radius often does more harm to the surgeon than to the injured one, but missing a dislocation of the os magnum condemns the patient to a serious disability."

Eigenbrodt[2] was one of the first to make a study of obscure carpal injuries, after the discovery of the roentgen ray. In his article he reviewed much of the old literature concerning the subject.

More recently Hessert[3], and Codman and Chase[4] have written extensively on the subject of carpal injuries, with particular reference to fracture of the scaphoid.

The scaphoid, as has been previously pointed out, really belongs to both rows of carpal bones, its position varying much with different positions of the wrist. This dual function is an important key to the mechanism of some carpal lesions.

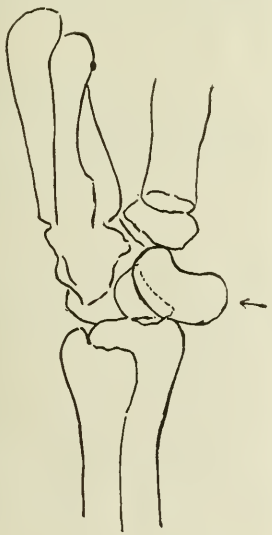
Probably somewhat similar application of force to that which produces the *luxation subtotal du carpe, retro-lunaire*, described by Jean and Mouchet is at times the cause of dislocation of the scaphoid, singly, or accompanied by other carpal injuries. This is usually a fall from a height, the blow being received on the "heel" of the hand, in forced hyperextension. All those who have studied the question agree that scaphoid dislocation is usually the result of a fall from a height on the hyperextended hand. The accident is apt to occur to carpenters, painters, roofers, and aviators. In such injuries if the radius does not give way the force of the impact is transmitted to the os magnum through the dorsal corner of the semilunar, which brings pressure on the neck of the scaphoid while the anterior part of the capsule fixes the bone at the centre. Ordinarily from this force a fracture through the neck of the scaphoid results. Probably in the case of dislocation there is a prying and squeezing force transmitted through the magnum and semilunar, to force the scaphoid out of its bed.

REPORT OF CASE.

F. L., a carpenter, 54 years of age, was examined for the Massachusetts Industrial Accident Board on April 7, 1919. The history of the accident in brief was as follows: On January 20, 1919, he was descending a ladder from a staging, when he slipped, falling a distance of some 20 feet, to a concrete floor. Besides the injuries to the left wrist which are of present interest to us, he received a depressed fracture of the right frontal bone, and a fracture of the head of the right radius. He was unconscious for some time after the accident and

received hospital treatment for some three weeks.

There was a history of good health and the patient had received no fractures previously. There was found on examination a depressed fracture of the right frontal bone, and a fracture of the head of the right radius, with much new bone formation about the elbow joint and practically no motion. There had been inability to use the left wrist since the accident, and complaint of aching, stiffness, and general disability of the hand. Examination showed marked bony thickening about the wrist, the styloids practically on a level. There were only a few degrees of active motion at the wrist joint in any direction, and attempts to increase this passively, caused pain. The thumb and fingers are stiff, he is just able to oppose the thumb to the index finger, and cannot flex fingers into palm. The grasp of the hand is weak, and rotation of the radius is restricted. On the palmar aspect of the wrist, just below the end of the radius, is a marked bony prominence. This is immovable and seems to block the wrist motions almost completely. It corresponds in general level to the situation of the carpal scaphoid. Radiographic examination showed



Dislocation Carpal Scaphoid
Lateral view. X-ray tracing.

the lower end of the radius was fractured, and there was complete dislocation of the scaphoid, with some displacement of the semilunar.

A subsequent examination (clinical) showed the bony mass on the palmar aspect of the wrist exactly the same as at the previous examination. The motions of the wrist were somewhat better, but the wrist was not in a condition to be of use to the patient. It seemed as if operation would give the only reasonable chance for a useful wrist. On account of the condition of the other arm the patient would not consider this.

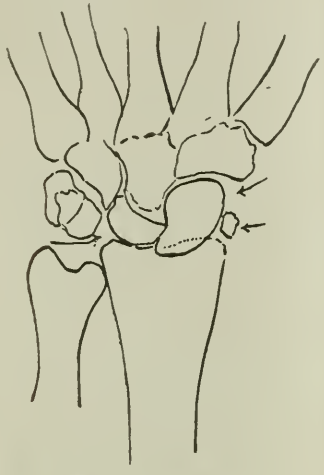
Among the few cases of carpal scaphoid dislocation reported, those of Hessert[3] and Kleinberg[5] more nearly parallel the one reported above than any others. In these two cases the dislocation was produced by the same type of violence, a fall from a height.

The report of Hessert's case is as follows:

A painter, 25 years of age, with a negative history previous to the accident, fell while at work on a scaffolding a distance of four stories, his fall being interrupted by several obstructions before he finally struck the ground with hands extended. He was unconscious for a time and was removed to hospital, where it was found that the injury to his wrist was the only important one. A diagnosis of fracture of the lower end of the radius was made and the arm was splinted. Hessert saw the patient four weeks after the accident. At this time there was marked disability of the hand. The fingers were flexed, and the patient could not pick up objects or move the fingers at all. Active and passive motion at the wrist was very much limited. On the palmar aspect of the wrist there was an oblong swelling, the upper part being most easily seen. It was rounded in shape and extended 4 cm. above the styloid of the ulna. There was no sensory disturbance present, but there was atrophy of the hand muscles. An x-ray showed the scaphoid and semilunar bones displaced far from their original positions, and separated from their ligamentous attachments. Operation was done and the bones were easily removed. Considerable improvement in the condition of the hand followed, and the man was able to handle a brush and grasp objects.

Kleinberg's[5] case was that of a laborer who fell from a fifth story window, injuring his left wrist. It was not possible to obtain a history of the position of the hand at the time of the injury. Kleinberg saw the patient seven weeks after the injury. At that time there was pain, swelling and disability of the wrist, hand and fingers. A mass of bone was easily palpable at the front of the wrist. It was directly under the skin and was freely movable in the lateral, but not in the vertical direction. Dorsum of the wrist was moderately swollen, with no hollow. There was no voluntary motion in the wrist, and there was 20° passive flexion. The man could not hold even a light object in his hand. X-ray examination showed a dislocation of the scaphoid and semilunar bones upward and forward to a position anterior to the ulna and radius. The scaphoid was entirely above the radio-carpal line. At operation both bones

were easily removed, being imbedded in subcutaneous tissue. Immediate improvement was very satisfactory. Function rapidly improved, so that the patient was able to grasp and hold a five-pound dumb bell. The outlook for full restoration of function seemed good.



DISLOCATION CARPAL SCAPHOID
Ant. post. view. Note chip fracture radius. Partial dislocation semilunar.

In connection with this and allied injuries the experiments of Honigschmied, which are quoted by Hessert are of interest, though they were performed relatively long ago. Other experimental work in this connection has not been done to any great extent.

Honigschmied experimented on the cadaver and forcibly extended the hand in 19 cases. A fracture of the lower end of the radius resulted in 17. In two cases no fracture resulted, but there was rupture of the anterior ligament of the wrist with anterior dislocation of the semilunar bone. In eight cases a preliminary dissection of the wrist was made before subjecting it to hyperextension. In five cases the palmar capsule was lacerated. Twice the scaphoid was partially dislocated and once the ligament between the two rows of carpal bones was torn, no carpal fractures were produced. Hyperflexion of the wrist was tried 25 times without previous dissection. In ten cases there was rupture of the dorsal carpometacarpal ligament. In seven cases there was partial separation of the dorsal capsule of radio-carpal joint and rhomboid ligament. In six cases rupture of the ligaments between the two rows of carpal bones resulted, and twice partial dislocation of the head of the os magnum was produced.

Much stress has been laid in evolving theories as to the mechanism of semilunar displacements on force transmitted through the middle metacarpal bone and os magnum to the semilunar in forced hyperextension.

It would seem that in the case of scaphoid dislocation from forced hyperextension that intercarpal ligamentous rupture with lateral torsion of the wrist would best account for this unusual injury. The bone is probably suddenly squeezed out of its bed as one "shoots" the stone from a cherry, as is so graphically described by Eigenbrodt in explaining the mechanism of dislocation of the semilunar bone.

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NOTE ON UNCOMPLICATED FRACTURE OF THE ZYGOMATIC ARCH, WITH REPORT OF TWO CASES.

BY FREDERICK W. O'BRIEN, M.D., BOSTON.

CLINICIANS consider uncomplicated fracture of the zygomatic arch a rarity, very probably because such fractures are usually accompanied by so little impairment of normal function that the injured person seldom seeks medical consultation.

Two cases of this type of fracture recently examined by me privately within three days are worthy of note. In one there was evidence of but slight trauma and in the other a history of pain and swelling following the extraction of an upper molar tooth.

It is a common occurrence for a roentgenologist to be asked by his patient if there is any danger of x-ray burn during the exposure. I am sure all answer with a certain superior air, "No," yet wonder in their hearts why it is that insurance companies demand an extra premium on liability policies of roentgenologists.

It is equally common for the dentist to be warned by his patient, prior to an extraction, to be careful and not break his jaw. I am sure he, too, receives this admonition with a smile and as something superfluous. Statistics are not available to determine the frequency of fracture in relation to extraction, though I have

no doubt that fracture of the zygomatic arch during tooth extraction must be extremely rare.

Todd has examined some 467 skulls. Where the injury was restricted to the zygomatic arch he found the types of two degrees, depression of the arch and fracture dislocation. Depression alone of the zygoma, usually most pronounced at the temporomalar suture occurred sixteen times, the injury being on the left side in ten cases and on the right in six. Both of the cases here reported were on the right side.

The more severe form in which fracture of the arch or dislocation at the temporomalar suture occurs was present fourteen times, twelve times on the left side and only twice on the right. Fracture may occur in the temporal part of the arch or in the malar part, or both; but Todd never saw the temporomandibular joint involved.

If there is sufficient trauma, local extravasation and swelling may obscure the actual condition of the bones on inspection. Some temporary disability in the action of the masticatory muscles may result, but in injuries confined to the zygomatic arch there is not apt to be any concussion as from a knock-out blow because of the architecture of this part of the face. Todd indicates the effect of a blow on the zygoma or outer border of the orbit as localized by the fragility of these bones and is not transmitted to regions further afield as is the case with the mandible.

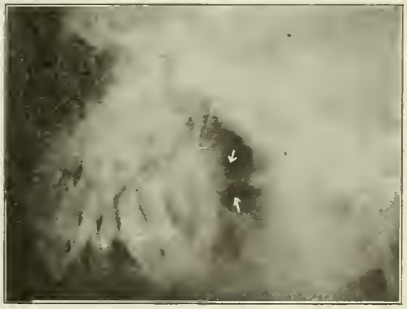
Though injuries to the zygoma often pass unnoticed and when found may seem unimportant, it is to be remembered that permanent impairment of a degree may result.

Crushing in of the zygoma may effect the movements of the temporal muscle. Osteophytic growths in the attachments of the temporal muscle and fascia have been reported, also arthritis of the temporo-mandibular joint.

Case 1 (Fig. 1). Male, F. M., referred, December 2, 1919, for examination of the right mandible with special reference to the temporomandibular joint. Patient gave a history of riding in a street car on a rear seat of the type that is lengthwise to the body of the car when it stopped suddenly and he was thrown sideways, his cheek striking the cross seat at his right. He complained of pain on mastication. There was some limitation of motion on opening the mouth, but no visible swelling or infiltration of the tissues. Examination by a competent dentist showed malocclusion. X-ray examination showed a definite fracture of the zygomatic arch, malar portion.

Case I. Fig. 1.

Case 2 (Fig. 2). Female, Mrs. J. A. F., referred December 5, 1919, for examination of the right upper jaw. She presented evidence of swelling and infiltration of the soft parts of the right cheek in the malar region and gave a history of extraction of an upper right molar a few days before, followed by pain and swelling of the face. X-ray examination showed a fracture of the zygomatic arch with considerable displacement of the fragments.



Case II. Fig. 2.

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Clinical Department.

THE TOOTH BRUSH AS A CAUSE OF REPEATED INFECTIONS OF THE MOUTH.

By Carolus M. Cobb, M.D., Lynn, Mass.

The presence of foci of infection in the mouth and throat is too well established to be open to argument. That these foci may lead to disease in distant parts of the body is also

well established. There is a very general tendency to remove the offending organ when it is proved to be the seat of a focus of infection. This is done without any very serious attempt to find its cause. The attitude of the profession seems to be to find the focus and cut it out. The patient is then expected to recover promptly from the secondary disease without further treatment. Of course, he very often does not, but that is thought to be the fault of the patient and not of the doctor.

It should be remembered that a focus of infection does not just grow, like Topsy, but that something caused it; and if not corrected it may cause another. Therefore, it follows that any treatment which will prevent the formation of these foci is worthy of most careful consideration. It is not the purpose of this paper to discuss the whole question of foci of infection in the mouth and throat, but to call attention to a possible cause of some cases of chronic infection of the mouth. Perhaps I cannot do better in the way of illustration than to give the details of a case which I feel sure can be duplicated by many medical men.

E. C., aged 26, had suffered from repeated attacks of infection of the mouth which always extended to the throat. These attacks were followed by mild rheumatic symptoms. Painting the gums with iodine or guaiacol would control the attack within a few days and the rheumatism was relieved by the salicylates. These attacks occurred not once but many times. There was no evidence of a focus of infection about the teeth and the case seemed a mystery which would be cleared up only by the removal of all of a set of perfectly good teeth. Finally it occurred to me that the tooth brush might be the offender. This, by the way, was used religiously several times a day. Therefore, I advised that the tooth brush be sterilized by soaking it in alcohol both before and after using. The brush, still wet with alcohol, was used to clean the teeth. This proved to be a solution of the mystery.

The history of this case is "significant of much," and I cannot see why it may not explain much of the persistent infection of the mouth and, perhaps, many cases of pyorrhea. It is not a particularly easy job to sterilize a tooth brush and as it is commonly used several times a day it does not become dry from one using to another. All the germs common to that mouth can and do grow on the bristles and the victim when next he uses the brush, rubs into his gums a culture of the flora of his mouth. It is evident that the long continued rubbing of such a culture into the tissues of the mouth may have a serious effect.

Tooth brushes as they are made today cannot be sterilized except by antiseptic solutions, and all of these are disagreeable and many of them are dangerous in untrained hands. Alcohol is the safest and the most convenient to use, but alcohol is hard to get. The happy solution of the problem would be for some one to invent a brush which would hold a piece of cotton or felt which could be thrown away after it was once used.

New Instrument.

PRACTICAL MOUTH HYGIENE.

BY ARTHUR CLARENCE JACOBSON, M.D., BROOKLYN, N. Y.

IN our personal hygienic ritual there is nothing more important than the daily cleansing of one's teeth, yet it cannot be maintained that present methods of attaining good buccal hygiene leave nothing to be desired.

With the toothbrush as now used we succeed in doing little more than removing some and redistributing more of the buccal detritus that accumulates upon the teeth, affecting the viscous film but little, and depositing a certain amount of the powders or pastes commonly employed. This is chiefly because of the impossibility of getting enough water into the mouth through the medium of the brush wherewith properly to wash it out. The methods in vogue are undeniably primitive, inadequate and irrational.

If the cleansing of the teeth of persons in good health is unsatisfactory, what shall be said of the buccal hygiene of sickness? The nurse finds this a great bugbear at the bedside.

The writer wishes to present two new and simple devices made of rubber tubing which supplement the toothbrush, making available a sufficient supply of water, and thus rendering unnecessary the futile attempts to irrigate the teeth during the cleansing process by frequent wettings of the brush. They make perfected cleansing of the teeth a reality, recalling, in a sense, the function of Carrel's tubes.

One device (Fig. 1) consists of a long length of small tubing cemented upon a short length of larger tubing, which latter is slipped over

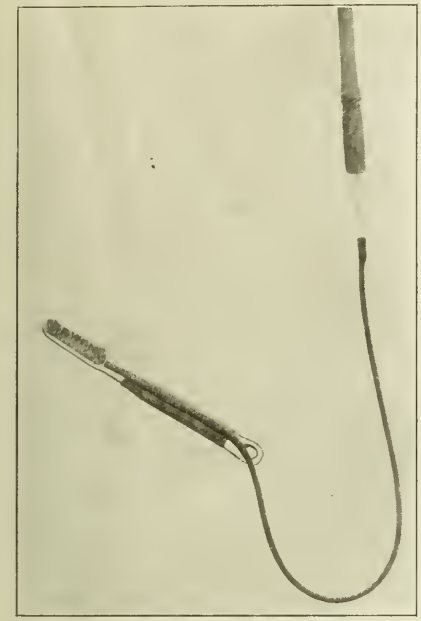

Fig. I.

the handle of the toothbrush, the smaller tubing lying over that part of the handle at the end of which are the bristles.

The long length of small tubing is connected with a larger tubing which attaches in turn to an irrigator.

The teeth may be brushed in the usual manner with the preferred paste or powder (though not strictly necessary), the rubber device, which fits any type of toothbrush, being then slipped over the latter's handle until the end of the small irrigating tube is in contact with the proximal end of the bristles, and the clip upon the large tubing attached to the irrigator released. The flow of warm water through the small and soft irrigating tube is thereafter controlled by pressure of the thumb against it and the handle of the brush.

The upper and lower teeth upon the left side are brushed with the right hand, the usual upward and downward and rotary motions being employed, and the corresponding teeth upon the right side are brushed with the left hand, the head being well tilted accordingly, to keep the side of the mouth undergoing cleansing well filled with water. The front teeth and all inner surfaces may be washed using either hand. Closing the lips upon the handle of the toothbrush during its use will, of course, give a larger amount of water with which to operate, the thumb now and then shutting off further supplies until the mouth has been emptied of the used water. The whole cleansing process may be carried out, however, with the mouth open and the water flowing in and out continuously.

After cleansing of the teeth by this method, they are entirely free from film and detritus, and the individual is pleasantly conscious that they have been properly brushed.

In the case of not very ill bed patients the irrigator may be hung at the head of the bed upon a portable post or upon the bedpost, the patient resting upon his right elbow while washing the teeth upon the right side with his left hand, and upon his left elbow while washing the teeth upon the left side with his right hand, the water being received in a suitable pan.

For very ill patients, the device in Figure 2 may be employed. This device permits the attendant to cleanse the teeth with the same full water supply as in the toothbrush method, but for the latter utensil the finger endowed with intelligence is substituted, protected by a

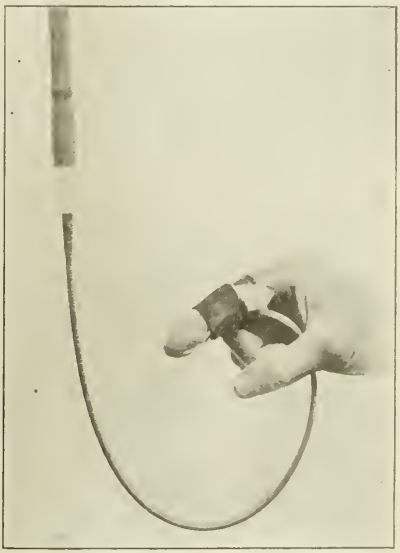

Fig. II.

cot from contamination. An antiseptic solution is employed instead of pastes and powders.

Over the right index finger is placed a cot, over this two square pieces of gauze cut from a four-inch bandage, and over all the device itself, consisting of a one-inch section of large tubing within which is cemented one end of a long length of small tubing. The small tubing delivers the water directly to the gauze on the end of the finger. The flow is subject to thumb pressure.

All the teeth may be gone over with this device without changing the elected position of the patient or the finger employed.

Instead of using two pieces of gauze one may, if preferred, use a layer of cotton between the cot and a single piece of gauze.

For children, the writer employs a small size of this device, placed upon the little finger.

This second device is excellent for the ordinary toilet of the teeth, either used alone or after the customary brushing, since it removes film very thoroughly.

These devices are so cemented as to withstand disinfection by boiling or otherwise.

The dream of a toothpaste that will "digest" or otherwise conquer dental films may as well pass in the face of these simple methods. The passing of the toothpaste or toothpowder itself is a desideratum, in the judgment of the writer.

Perfected methods of cleansing the teeth would undoubtedly lessen the incidence of dental pathology and its remote consequences. But upon esthetic grounds alone their desirability cannot be gainsaid.

Book Reviews.

Diseases of Women. By CHARLES MONTRAVILLE GREEN, A.B., M.D. Boston: W. M. Leonard. 1920.

The second edition of *Diseases of Women*, including discussion of abnormalities of pregnancy, labor, and puerperium, and presenting a clinical study, with case histories, of pathological conditions characteristic of the five periods of a woman's life, will prove to be of great value to teachers, medical students, and graduates. As in the first edition, the book is arranged logically in five sections, dealing with infancy and childhood, puberty and adolescence, maturity, the climateric, and anility. Each division is preceded by an introduction, and the functional disorders, malformations, infections, and neoplasms occasionally brought to the gynaecologist's attention are commented upon in relation to the epoch in a woman's life during which they most frequently occur. The one hundred and seventy-three case histories which compose the body of the book are grouped in the five sections to illustrate the various diseases and conditions which have been observed among patients. In each case are recorded the diagnosis, treatment and result, followed by comments emphasizing the most significant facts and the lessons which may be learned from the author's observation and experience. This method of recording case histories in writing was developed by Dr. Green during his teaching of obstetrics in order to convey more thoroughly than is possible by the clinical method alone the lessons he has learned from actual experience in practice.

The work has been improved in its second edition by certain textual revision, and in addition by extending comment on a number of cases, including myoma of the uterus, cardiac disease complicating pregnancy, and vulvovaginal injuries from coitus. The sexual relations of husbands and wives have been commented upon, and suggestions made as to advice which may well be given to prospective husbands. The text is illustrated by twelve full-page plates, one cut, and twenty-five charts. This edition will prove to be of even greater value and service to the profession than did its excellent predecessor.

Early English Magic and Medicine (British ACADEMY ADDRESS.) By CHARLES SINGER. London: Oxford University Press. 1920. 8°, 34 pp.

This is a study based upon original investigations covering some 15,000 hitherto unexplored manuscripts. Early British medicine was mainly magic and folk-medicine. The domination of European thought by Moslem learning, which set in about the 12th Century A. D., did not affect England until the middle of the 13th Century. Dr. Singer cautions us that the date of a given manuscript affords no clue whatever to the antiquity of a magical practice, since the written word in a savage tribe, newly converted to Christianity, was first the medium of law, religion and commerce, and, only generations later, of folk-ways. The writings of the Venerable Bede (13th Century) reveal nothing of the society around and about him, while *Beowulf* or the *Laeunnga* (13th Century) are replete with half-heathen practices. Again, magic, among all races, is essentially a syncretic or blending process, passing easily from

people to people, the rational concepts of the superior class suffering a "degradation of energy" in the lower strata of society. A Greek sentence degraded into a charm, in an Anglo-Saxon manuscript, has no necessary connection with Greece, nor is the language of an early British manuscript, whether Latin or Anglo-Saxon, of any significance in itself. The leech-books were lay products and show little evidence of learned, *i.e.,* clerical influence; the leeches in the illustrations are never represented as tonsured.

Singer divides these early writings, according to cultural influences, into eight classes, *viz.,* (1) Graeco-Latin, (2) ecclesiastical, (3) Salernitan, (4) native Teutonic, (5) Celtic (Celto-Roman, Hisperic), (6) South Italian, (7) Byzantine, and (8) pagan Roman.

1. Latinized Greek medicine, often a hodge-podge of pseudonymous compilations in barbarous Latin, was the true Dark Age of "monkish" medicine, common to South Italy, Gaul, Britain, the Rhineland and Switzerland during the 4th-11th centuries. It was practised in its entirety at the monastery of St. Gall and formed the ground-work of early English medicine, revealing here some remarkable contact with Celsus, a writer elsewhere unknown throughout the Dark and Middle Ages. This phase of British medicine was based upon mystic diagrams, showing a parallax between the four ages of man, the four seasons, the four elements, the four humors of the body, the four cardinal points, the initials of which make the word ADAM, to which the term *protoplast,* derived from the Mozarabic and other liturgies, is attached in the text. Thus the term *protoplasm,* introduced by the physiologist Purkinje in 1837, is of liturgical derivation (8th Century). The sphere of Pythagoras, a magic device from a Greek papyrus of the 3rd Century, was used for prognosis, *i.e.,* to determine the imminence of death, the advisability of extreme unction and the most favorable time for bloodletting.

2. Derived (non-native) ecclesiastical influences are in evidence through the whole corpus of Anglo-Saxon medicine in the innumerable *pater nosters* associated with magic practices.

3. Salernitan influences (pure Greek medicine streaming from Magna Graecia, Byzantium and Toledo) are easily traceable by using the great Breslau codex as a control.

4. Native Teutonic (Indo-Germanic) magic was remarkable for the doctrines of nine specific venoms, nine healing herbs, the serpent or worm as a cause of disease, the notion of the transmission of disease by blowing or by poisonous blasts of air, and of the causation of disease by elf-bolts (against which these prehistoric flint "celts" are still worn as amulets). These are the most essential features of Indo-Germanic and Anglo-Saxon medicine. In literary form, the charms and incantations cited are singularly like those in the Atharva, or those in Sumerian, Polynesian and American-Indian folk-lore, or in the Nibelungenlied; but the Babylonian and Biblical notion of a specific demon of disease, possessing the body, is essentially Oriental and never found in true Aryan medicine.

5. Celtic influences are apparent in various charms and in the magic "circle of Columcille," found also around the stone crosses of ancient Ireland. The Hisperic influence is traceable in the barbarous Latin, interlarded with a jargon of exotic words, which characterizes this mysterious body of literature.

6. The most attractive element in Anglo-Saxon medicine is the South-Italian plant-lore. The texts in these manuscripts are poor stuff, derived, without change, from Latinized originals which had been in circulation centuries before. The water-color illustrations constitute one of the most interesting phases of mediaeval medicine, for their object was utilitarian, to enable the herb-gatherers to recognize the plants. Here mediaeval art, usually fantastic, attained to a high degree of realism. The tradition of plant-painting went back to the work of the rhizotomist Cratevus (1st Century B. C.), but the standard sources were the two Vienna codices of Dioscorides (6th-7th centuries), the stereotyped tradition persisting even unto the Smyrna *Physiologus* of the 11th Century. The Anglo-Saxon MSS. show Southern rather than Viennese influences. There is servile, conventional copying in the earlier MSS., excellent free-hand drawing from living plants in a St. Albans MS. of 1120, dwindling again to mere decorative patterns in the Norman period.

7. The Byzantine element consists, in the main, of periapts or charms (often sheer gibberish) derived from sentences in the Greek liturgies, *e.g.,* the sonorous line in the liturgy of St. Chrysostom, which preceded the elevation of the host—

στῶμεν καλῶς. στῶμεν μετὰ φόβου

Let us stand seemly; let us stand in awe.

became degraded by the superstitious peasantry into a tag to stop uncontrollable hemorrhage, *viz., stomen calcos stomen meta fofu.*

8. A lengthy conjuration, in the shape of a pagan Roman spell, concludes the paper. The author makes no summaries, draws no conclusions, but these are implicit in his remarks about the syncretic nature of magic itself. W. H. R. Rivers found Polynesian massage to be a true, rational therapeutic procedure, while Melanesian massage is mere hocus pocus superimposed upon the ordinary ritual of Melanesian magic. So early mediaeval magic, preceding, as it did, the deadly dull period of Arabic domination in medicine, is comparable, as to its syncretic character, with those bad blends of alcoholic liquors which initiated, and perhaps justified, the "dry" period.

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THE ESTABLISHMENT OF MATERNITY AND INFANT WELFARE CENTERS.

THROUGHOUT the country, considerable interest is being manifested by communities in the establishment of some form of child-health supervision and maternity care. In many instances investigations have been conducted by the coöperative efforts of the Public Health Service and State boards of health and maintained at local expense. Some communities have employed public health nurses for carrying on child-welfare work; others have organized maternity and baby health centers. As the extent to which this work is organized depends not only upon the resources of communities but also on public-health education, it may be useful to call attention to abstracts, published in a recent Public Health Report, from a memorandum issued by the British Ministry of Health in regard to maternity and infant welfare centers.

The primary purpose of the infant welfare center is in the main educational; mothers are given advice and instruction in the care and management, feeding and clothing of infants and children under school age. Each mother should be interviewed individually at the time of consultation by some competent member of the teaching center. This can be followed up by collective teaching by demonstrations and health talks to groups of mothers. Women pregnant for the first time often need special classes for instruction in the most elementary hygienic principles. Other classes in sewing, home nursing, infant care, personal hygiene, cooking, and first aid can be made both helpful and interesting.

In order that the infantile welfare centers may be easily accessible to mothers, the density of the population should be estimated and the districts made as compact as possible. It is probable that a center cannot adequately take care of an area larger than one in which about four hundred births occur annually and the daily average attendance is not above thirty or forty. Every child attending the center should be seen by the medical officer at certain intervals: children under six months of age at least once a month, and older children less frequently. Home visiting by a public health nurse affiliated with the center is important in following up the work of the center and in securing regular attendance. There should be included in the medical staff one or more physicians skilled in the diagnosis of children's diseases and in the nursing staff one or more public health nurses trained in child supervision, whose duty it shall be to assist the physician, weigh and measure children, assist mothers in preparation for examination by the physicians, and visit the homes of the mothers.

Each infant welfare center should be equipped with a waiting room, which may be used for classes, a weighing room, a consultation room for the use of the physician, and adequate sanitary arrangements. As a general rule, except for minor ailments, treatment should not be given at the center but at some hospital or out-patient clinic with which special arrangements may be made. The British plan of linking several welfare centers with one center devoted solely to treatment has been found practical in that country and might be followed here. It would be well for infants under six months to be weighed every week,

for those between six months and a year, once every two weeks, and for older children to be weighed at intervals varying from one to three months. The interest of mothers is increased and their attendance seems to be improved by the distribution of weighing cards on which the weights of the children are recorded regularly. Wherever it is possible to do so, milk should be sold to mothers at a cost slightly under retail price, and given free of charge to those unable to pay for it. If the funds of the center are sufficient to allow it, there may be provided a few beds so that premature infants and poorly nourished children may be cared for under scientific supervision.

Mothers seem to appreciate less the value of medical supervision during pregnancy than the care of their infants after they are born. It is the function of the maternity center, therefore, to gain the interest and confidence of the mother and advise her in regard to conditions directly associated with pregnancy and with ailments which indirectly affect her physical welfare and that of her child. The center should be made attractive as well as useful and the competent aid secured of physicians and widwives, public health nurses, and other agencies. In promoting the work of the center, the mothers themselves may often assist by helping to educate the public to an appreciation of the value of the services which the center is prepared to give. The maternity center should be provided with suitable rooms for waiting, dressing, and consultation, and a special gynecological chair, couch, or table. There should be also adequate facilities for the testing of urine and, if possible, provision for the examination of pregnant women suspected of having tuberculosis. The work of the maternity center should include consultation by a qualified physician, home visiting, educational classes in the hygiene of pregnancy, the provision of milk or food in cases where it is needed, dental treatment, arrangements with state and municipal laboratories for microscopic and serologic diagnosis in cases of suspected venereal disease, and provision whereby complicated cases may be cared for at some lying-in institution.

The value of the infant welfare and maternity centers has been demonstrated in many communities. There still exists a need for considerable enlightenment on the part of the public before the benefits of this work can be fully appreciated and adequately extended.

PUBLIC HEALTH ADMINISTRATION IN A RURAL COMMUNITY.

An excellent illustration of what can be accomplished in rural communities by efficient public health administration is the work carried on in Waterville, Maine. The Waterville Board of Health consists of three members, appointed by the mayor for terms of three years. The secretary is, *ex-officio*, executive officer of the board, and has control of communicable disease, the abatement of nuisances, and such other public health work as comes under the jurisdiction of the board. The health officer, who is also school physician, is called upon only for consultation by the secretary of the board, as for differential diagnosis of doubtful cases. For the year 1919, the total expenditures for health and sanitation, exclusive of sewer maintenance, amounted to $1,621.85, which, divided among an estimated population of 13,276, makes a per capita expenditure of 12.2 cents. That health, within reasonable limits, is purchasable has been demonstrated by the public health organizations of the larger cities; Waterville is proving that smaller communities also can attain a high degree of public health when their citizens are awakened to the possibilities of progressive public health methods.

There were reported in Waterville, for 1919, 354 births, giving a birth rate of 26.6 per one thousand of population, an exceptionally high rate for a Maine city. The reporting of births by local physicians was found to be very lax, but the withholding of fees for births not reported within five days is proving to be an effective stimulus to prompt reporting. As far as can be determined, the reporting of deaths is accurate and complete. During the year, 197 deaths were reported, giving a death rate of approximately 14.08 per thousand of population. Of these deaths, 101, or 56%, were due to preventable causes, and it is the expectation of the Board of Health that this percentage can be reduced in the future when proper preventive measures can be carried out more completely. The infant mortality rate was 81.9 per thousand. The high number of still-births, eight per one hundred normal births, indicates the need of increased educational and preven-

tive work. Pregnancy work is one of the activities contemplated by the directors of the Waterville-Winslow Health Center and should be of great value. This health center is maintained jointly by the local chapter of the Red Cross, the State Department of Health, and the United States Public Health Service. It is in charge of the district nurse who is employed by the Red Cross and devotes part of her time to clinics and follow-up work. At present, medical service is supplied by local physicians, but it is expected that a regular medical staff will soon be provided. Thus far the clinics have been limited to venereal cases, but it is planned now to add tuberculosis, child welfare, and pregnancy work. The Health Center has been established for only about six months, so that definite results cannot be ascertained as yet; but it is arousing interest in public health work and undoubtedly will continue to enlarge its field of usefulness in the future.

There are two hospitals in Waterville; both are private institutions, the Sisters' Hospital and Gray's Hospital. The combined capacity of these hospitals is inadequate for the population, the first having thirty-eight beds, the second a normal capacity of seventeen beds and an emergency capacity of twenty-five beds. Both hospitals are open to the use of the doctors and the people in their vicinity; no house doctor or interne is maintained by either hospital.

All phases of hygiene and sanitation in the public schools are under the control and supervision of the city board of education. All pupils and teachers are given a physical examination annually by the school physician. The required examinations for eyesight and hearing are made by the teachers. There is no separate dental examination, and no school nurse is employed. Thus far, systematic physical training has not been given in the Waterville schools, but it is planned to have a full time physical instructor for work in all the grades next year. The sanitary and hygienic conditions in the newer school buildings are very satisfactory, the weakest point being ventilation. Since the introduction of the water supply from China Lake in 1905, not one case of typhoid has been traced to this source. The milk supply has been under the control of the health department since January, 1920, when a city milk inspector was appointed. He has mapped out a system of examination of samples of all milk sold in Waterville for butter fat, adulteration, and sediment, and has planned a system of inspection for dairies, creameries and delivery wagons, arranging with the State and Federal Departments of Agriculture for the tuberculin testing of all herds making milk for the Waterville market, without cost to the owners. Practically all the local milkmen have availed themselves already of this opportunity to protect their herds and their customers. The requirement that all applications for state licenses to sell milk in the city be approved by the local milk inspector greatly facilitates the control of sanitary conditions in production and distribution.

Efforts are being made continually to increase efficiency and to enlarge the activities of the Waterville public health administration. It has been recommended, for example that a health union be formed with two or three of the adjoining towns for the employment of a trained, full-time health officer; that the citizens of Waterville be urged to coöperate in making the Health Center the nucleus of public health activities; that a school nurse be employed to supplement the work of the school physician and to assist in the teaching of personal hygiene in the public schools; that the annual dental inspection of school children by a professional dentist be added to the present medical inspection; that Waterville enact a comprehensive sanitary code to facilitate and standardize public health work in the city. These recommendations indicate the progressive purpose of the public health administration of Waterville; such efforts, supported by the interest and coöperation of the citizens, would improve greatly the health conditions in similar communities.

MEDICAL NOTES.

ST. MARY'S HOSPITAL OF ROCHESTER, MINNESOTA, conducted by the Sisters of St. Francis, is, in every sense of the word, a modern hospital, well equipped in every detail. Although essentially Catholic, the hospital receives patients of every religious denomination and all non-Catholics may be visited by their clergymen at all times. St. Mary's Training School for Nurses was established in November, 1906. It offers to young women between the ages of

20 and 35 years, who are high school graduates, a course of three years' instruction in the various departments. This school is in affiliation with the largest hospital in the state of Minnesota, the City and County Hospital of St. Paul, where students are given part of their training. The school year covers a period of thirty-four weeks, offering a valuable lecture course by the members of St. Mary's Hospital staff. Classes and demonstrations from approved manuals and textbooks are conducted by the superintendent of nurses and a trained instructor. St. Mary's Hospital was founded in 1889 by the Sisters of St. Francis, Rochester. It was formally opened October 1, 1889, with a capacity of forty-five beds. During the first year of its existence over three hundred patients were admitted. The number of patients increasing each year, enlargement became necessary, and additions to the original buildings were made in 1893, 1898, and again in 1903 a large fireproof addition, built of steel, brick and tile, was constructed at an expense of $100,000. The accommodations in this building are excellent. In 1908 a new fireproof west addition, increasing the capacity of the hospital one hundred beds, was completed at a cost of $150,000. In 1912 a new modern fireproof southern extension five stories high, constructed of brick and reinforced concrete, was built, further increasing the capacity of the hospital by eighty beds; also a magnificent new nurses' home of similar construction to above, and power house and heating plant, at a cost of about $400,00. In 1910 a surgical building, at the cost of one and a half million dollars and having a capacity of about 300 beds was begun. The present hospital will be used for medical purposes, making St. Mary's a general hospital instead of being exclusively surgical, as it has been in the past. Up to the present time the hospital has received and cared for over 104,667 patients.

The Aiken Cottage Sanatorium at South Carolina.—The Aiken Cottages at Aiken, South Carolina, were incorporated in March, 1897, for the care and treatment of men in reduced financial circumstances suffering from incipient pulmonary disease. The twenty-second report of the sanatorium covers the years 1917 to 1919. During the year 1918-1919 the institution received an unusual number of patients because of the great number of cases discovered through draft examinations. In spite of the increased cost of living, the charge to patients has never risen above five dollars a week, the same amount that was asked when the sanatorium was organized in 1897. No appeal for funds has been made for several years.

During the year of 1917-1918, eighteen patients were admitted, of whom seven cases had improved definitely at the time of discharge and two were apparently arrested. In 1918-1919 twenty-one patients were admitted; upon discharge, one case was apparently arrested, one quiescent, twelve improved, and six unimproved. The report contains several interesting letters from patients who were benefited by treatment at the Aiken Cottage Sanatorium.

Decoration of American Woman Physician.—The Order of King George has been conferred by King Alexander of Greece on Dr. Blanche Norton of Eldon, Iowa, a physician of the American Committee for Relief in the Near East. While treating the trachomatous eyes of Greek orphans at Kerrassunde, Anatolia, Dr. Norton contracted the disease herself. She is the first woman to receive the order.

Methods of Destroying Rats.—The United States Public Health Service has warned the country of the danger of bubonic plague if serious efforts are not made to eliminate rats. The plague has appeared in a number of Mexican and American gulf ports and at points in the Mediterranean. The Health Service Bulletin has stated that rat destruction can be accomplished by individual effort to a limited degree, but to be successful in a large city there must be rat-proofing of buildings.

"Rats can be destroyed by trapping, by poisoning, and by using natural enemies, such as certain breeds of cats and dogs. To insure the success of these measures it is necessary to curtail the rat food supply by properly disposing of garbage and table refuse, and by preventing rats from gaining access to such foods as are contained in pantries, groceries, markets, stables and the like.

"The trap should be placed wherever rats have been accustomed to come for feeding purposes and should be more or less concealed, the snap trap by scattering dust, cornmeal or flour on or about them, and the cage trap by pieces of sacking, straw or rubbish, leaving only the opening free.

"The destruction of rats by poison has always been more or less in favor. A preparation of arsenious acid or phosphorous, 10%, and

suitable base, as cheese, meat, or glucose, are the most popular poisons. Poisons undoubtedly have a certain efficiency in ridding a place of rats, but whether by causing their migration or their actual destruction is somewhat difficult of determination.

"In rat-proofing any building, the following parts have to be considered: ground area, walls, ceiling, garret, roof, bed spaces in general, ventilators, abandoned sewers, doors, windows, outside piping, water and sewerage pipes, down spouts, wiring and air or light shafts. By the omission of some small detail an otherwise rat-proof structure may become badly rat-infested."

It has been urged that city anti-rat ordinances and state anti-rat laws be demanded.

BOSTON AND MASSACHUSETTS.

WEEK'S DEATH RATE IN BOSTON.—During the week ending August 7, 1920, the number of deaths reported was 152 against 167 last year, with a rate of 10.60 against 10.94 last year. There were 30 deaths under one year of age against 38 last year.

The number of cases of principal reportable diseases were: Diphtheria, 27; scarlet fever, 25; measles, 14; whooping cough, 48; typhoid fever, 4; tuberculosis 32.

Included in the above were the following cases of non-residents: Diphtheria, 6; scarlet fever, 6; measles, 1; whooping cough, 3; typhoid fever, 1; tuberculosis, 2.

Total deaths from these diseases were: Diphtheria, 1; scarlet fever, 1; whooping cough, 4; tuberculosis, 16.

Included in the above were the following non-residents: Tuberculosis, 2.

Infantile paralysis, 5 cases and 2 deaths.

DEMONSTRATION OF PLAGUE CONTROL.—Dr. William C. Woodward, Health Commissioner of Boston, Dr. Philip Castleman of the Health Department, and Mr. Herbert A. Wilson, Building Commissioner, left Boston to attend a demonstration given at Galveston, Texas, on August 3 and 4, of the methods of plague control and the application of repressive measures against disease-breeding rats. The demonstration was arranged by the Federal Public Health Service, and was attended by health and building representatives from all over the country.

BEQUESTS TO MEDICAL INSTITUTIONS.—The will of the late Miss Henrietta M. Pierce of Dorchester has provided for a gift of five thousand dollars each to the Boston Home for Incurables and the Children's Hospital.

RETURN OF LEPERS TO PENIKESE ISLAND.—It has been decided that the two lepers whose cure was expected through the use of chaulmoogra oil must return to the leper colony on Penikese Island for further treatment. A special medical board which was appointed to study their cases has reported that although their condition is greatly improved, bacteriological tests show that some of the leprosy bacilli still remain in their blood.

RESIGNATION OF DR. ALBERT S. HYMAN.—Dr. Albert S. Hyman, resident physician at the Long Island Hospital, has resigned from that institution, his resignation to take effect August 1. Dr. Hyman is to become superintendent of the Mt Sinai Hospital in Philadelphia. Dr. Albert B. Murphy, who has been an assistant resident physician at the hospital, has been appointed Dr. Hyman's successor.

WORK OF BOSTON PHYSICIAN IN ECUADOR.—The work of a Boston physician, Dr. Michael Connor, has been praised by United States Consul General Frederic W. Goding of Guayaquil, Ecuador. Dr. Connor, with the support of the Rockefeller Institute, succeeded in eradicating yellow fever from Ecuador after working diligently at the task for 18 years. Yellow fever had been a scourge in Guayaquil and elsewhere in Ecuador for many years, and in 1890 this Institute sent the Japanese bacteriologist, Dr. Noguchi, to Guayaquil, where he accomplished a considerable amount of work. An effort was then made to have a commission sent to undertake to drive out the disease, but the plan was given up because the consent of the people could not be gained. In 1900, however, Dr. Connor was sent from Boston and the Institute placed at his disposal the sum of one hundred thousand dollars, to be used at his discretion. Dr. Connor went alone, although he was permitted to take with him as many assistants as he desired. For 18 years Dr. Connor studied the disease and made steady progress against it by improving the sanitary conditions. On March 23, 1918, the last death from yellow fever occurred, and it is expected that the disease will not appear again unless it is brought in from some other country. Inoculation was employed as one of the ways of checking the disease.

Publication of the Judge Baker Foundation.—The Judge Baker Foundation has issued recently a volume in memory of Harvey Humphrey Baker, the first Justice of the Boston Juvenile Court. This is the first of a contemplated series of publications to be issued by the Foundation. The subsequent ones will probably be scientific studies of Dr. William Healy and Dr. Augusta F. Bronner, Directors of the Foundation, and by other members of the staff.

Bequests to Medical Institutions.—The following bequests are included in the will of the late Charles L. Davis of Roxbury: $5,000 each to the Boston Floating Hospital, the Massachusetts Homeopathic Hospital, and the Boston Dispensary; $1,000 each to the Massachusetts Women's Hospital, Perkins Institute and the Massachusetts School for the Blind, Infants' Hospital, Free Hospital for Women of Brookline, Convalescent Home of the Children's Hospital, Talitha Cumi Maternity Home and Hospital, Boston Nursery for Blind Babies, Instructive Nursing Association, and the Cullis Consumptives' Home in Dorchester

NEW ENGLAND NOTES.

Appeal for Nurses.—In response to an appeal issued by the surgeon-general of the Public Health Department for the American Red Cross to provide four hundred nurses during the next three months, a campaign for recruiting nurses has been begun by the New England Division of the Red Cross. It has been stated that ultimately four thousand nurses will be needed in the public health service hospitals to care for disabled soldiers and sailors. A letter has been sent by the director of nursing in the New England Division to all State and local nursing committees in the New England States, excepting Connecticut, requesting assistance.

War Relief Funds.—The following contributions have been announced by the New England branches of war relief funds:

American Memorial Hospital Fund	$360,319.44
Italian Fund	330,865.07

Bequest to the Eastern Maine General Hospital.—The Eastern Maine General Hospital at Bangor, Maine, has received the sum of ten thousand dollars by the will of the late Dr. Thomas Opham Coe.

Correspondence.

MATERNITY AID.

Somerville, Mass., Aug. 7, 1920.

Mr. Editor:

Without entering into a discussion as to whether "maternity aid" in Massachusetts will be beneficial or not, I desire to enter my protest to some statements contained in the article in your last issue entitled "Maternity Aid," and especially I wish to take exception to the sentence which says, "The condition of obstetrics in this state is intolerable."

The practice of obstetrics has been in the hands of the medical profession in Massachusetts—at least that has been the professional opinion and, to a great extent, that has been the lay opinion. There are some communities in which the midwife practices. To what extent it prevails I am not competent to say. In the minds of most medical men, the above quotation is paramount to a serious charge against the medical profession. It surely conveys the idea that a willing and not uninterested public has trusted the profession and the profession has failed ingloriously in protecting human life. Such a sweeping indictment against the whole medical profession has never before appeared in print in any kind of a newspaper in Massachusetts. As a humble member of the profession I protest vehemently against charges as serious as these which go out unqualified to the community.

Therefore, it behooves those of the profession who are in any way interested in the preservation of human life to ask for an honest, impartial, and scientific inquiry into the condition of obstetrics practice in Massachusetts, to the end that, if the fault lies with the profession, it should be corrected. If it lies without the profession, the profession should use its greatest endeavors to bring about a change. It is not within the scope of this communication to analyze the cause of each of the 804 deaths that occurred in Massachusetts in 1918 that are tabulated in the report of the vital statistics of the state of Massachusetts under the heading *Puerperal Stage*. It is not fair to take, as the Journal did, the figures 804 without some explanation as to what the 804 deaths meant. For convenience in tabulation, the state of Massachusetts has made the following classification:

Puerperal Stage.

1. Accidents of pregnancy.
2. Puerperal hemorrhage.
3. Other accidents of labor.
4. Puerperal septicemia.
5. Puerperal albuminuria and convulsions.
6. Puerperal phlegmasia alba dolens, embolus, sudden death.
7. Following childbirth (not otherwise defined).
8. Puerperal diseases of the breast.

Quite an array, I am sure! All the deaths in these many subdivisions, by some people, at least, are charged up to poor obstetric practice and inferentially the profession must pay the penalty, if not for its sins of commission, in any event for its sins of omission. At first glance, 804 deaths seems startling, but a fair analysis of these figures, especially for the year 1918, will put a different face upon the matter, for it is not possible to prevent all deaths that occur in the puerperal stage. It might be interesting, Mr. Editor, to analyze the number of deaths from puerperal septicemia in Massachusetts.

In 1918, of the 354 cities and towns in Massachusetts, puerperal septicemia occurred in 47. In other words, about 13% of the cities and towns in Massachusetts had from one to 45 deaths from puerperal fever. Three hundred and seven cities and towns had

none. That surely is not an intolerable condition from a medical standpoint. It is interesting to note that the largest number of cases of puerperal sepsis occurred in large cities,—in cities where there are good hospital facilities, visiting nurses, Public Health nurses, opportunities for pre-natal and post-natal care; in cities where the people and the profession have been especially generous in money, time, and advice.

In 1917 of four cities of Massachusetts of which the population is about 100,000, each had six deaths from puerperal fever, and in four cities of which the population is between 50,000 and 100,000, two cities had three deaths from puerperal fever, one city had four deaths, and one city had two deaths.

In 1917 the number of deaths from puerperal septicemia was 194. In 1918 the number of deaths from puerperal septicemia was 159.

In 1917 in one city of nearly 200,000 people there were 24 deaths from puerperal sepsis. In 1918, in the same city, there were nine deaths. In another city of nearly 100,000 people, six deaths occurred in 1917 and three deaths in 1918.

In 1917 Gloucester did not report any deaths from puerperal sepsis, and in 1918 Salem did not report any deaths from puerperal sepsis.

One city of over 25,000 inhabitants, which has the reputation of being the home of some of the wealthiest citizens of the commonwealth and whose practitioners are considered among the most able and progressive of the profession, had four deaths in 1919 from puerperal sepsis. A large industrial city of which the population in 1915 was over 60,000, reports one death.

In 1915 Norfolk and Hampshire Counties did not report any deaths from puerperal sepsis.

Whether or no deaths from puerperal sepsis after criminal abortions or after abortions that are not criminal are classified under the puerperal stage I have not been able to ascertain, nor do I find such deaths classified separately in the report of vital statistics.

But I do find under the heading of "Accidents of Pregnancy" in 1918, 209 deaths, and under the heading of "Other Accidents of Labor" in 1918, 194 deaths. What "Accidents of Pregnancy" and "Other Accidents of Labor" may mean, I do not know, but they were responsible for 403 deaths. I also find that in the influenza months of September, October, November, and December of 1918, the deaths in the puerperal stage were twice and sometimes three times as many as they were for a corresponding period four or five years before 1918.

This letter is not written for the purpose of controversy. It is not an argument pro or con in the question of maternity aid. It is a protest against sweeping assertions in regard to a point in controversy and further it is a plea for justice and sanity in reading in their proper light and perspective statistics in regard to sickness and death.

Most respectfully,

CHARLES E. MONCAN, M.D.

MATERNITY AID.

Somerville, Mass., Aug. 7, 1920.

Mr. Editor:

I have words of comfort for the author of the "Maternity Aid" editorial of August 5th. To begin—I am sure the statistics of the year 1919 will show a most gratifying return to a low average of "puerperal deaths," because the conditions which were responsible for the terrible puerperal mortality of 1918 no longer exist.

Beginning with the latter part of 1917, general practitioners and nurses went into the Federal Service in increasing numbers until, by September, 1918, a very large percentage of those physically able were in their country's service. Thus their obstetrical work, in which they are so highly proficient, was left largely to the care of obstetricians and midwives.

Moreover, very many general or family practitioners were serving on draft and advisory boards, and in various other lines of war activities.

The calls for obstetricians or midwives in the army or navy, or for service on draft or advisory boards were not many.

Then, early in September, 1918, came the pestilence, and the general practitioner was in the first line of the influenza battle. Obstetricians and midwives are not expected to know much about influenza or influenza-pneumonia.

Of the 804 puerperal deaths in 1918, 444 occurred in the last four months of that year: September, 102; October, 185; November 59; December, 98.

In the first 8 months of 1918 the mortality was 360, giving an average of 40 a month. If this ratio had been kept up, the puerperal mortality for the year would have been only 480. Had the mortality of the last four months been present during the first eight months, the mortality would have been 1332.

I have also taken the corresponding figures for the four years 1910 to 1913, inclusive, and for the three years 1915 to 1917, inclusive. In the time at my disposal I could not get the figures for 1914.

In the years 1910 to 1913, the average yearly mortality was 452.5, the average for the last four months of those years was 124.75. Of the three years 1915, 1916, and 1917, the average mortality was 534.33 and for the last four months, 156.

In every one of these seven years, the mortality of the last three months was less than a third of the total mortality.

Most respectfully,

FRANK E. BATEMAN, M.D.,

Physician in general practice.

LABORATORY TRAINING FOR NURSES.

Owing to the apparently increasing demand for graduate nurses who are also proficient in laboratory technique, a course of instruction has been arranged by the Massachusetts Homeopathic Hospital. The course consists of continuous work for one year in the laboratories of Boston University and of the adjoining hospital. It includes didactic and practical instruction in bacteriology, hematology, urinalysis, and serology, together with actual performance of large numbers of the various tests and examinations that come within the scope of a general pathological laboratory. Each student will be expected to devote every morning, Sundays excepted, and at least four afternoons a week to the work.

Arrangements have been made to include instruction in and practical application of the various forms of anesthesia for a period of three months. No fee for the course will be made, each student receiving board, room and laundry during the period of her stay. In certain instances an additional period of three months can be arranged for instruction in x-ray technique. All applications should be addressed to

DR. H. M. POLLOCK, *Supt.*,
Massachusetts Homeopathic Hospital,
Boston, Mass.

RECENT DEATH.

DR. JOSEPH D. WHOLLEY died recently at his home in Brighton at the age of 28 years. Dr. Wholley was born in Chelsea. He was a graduate of the Harvard Dental School in the class of 1919. He is survived by his mother, a brother and three sisters.

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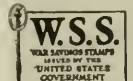

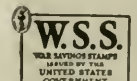

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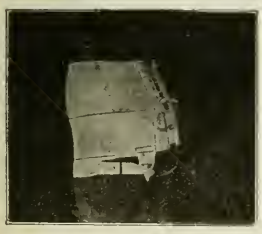

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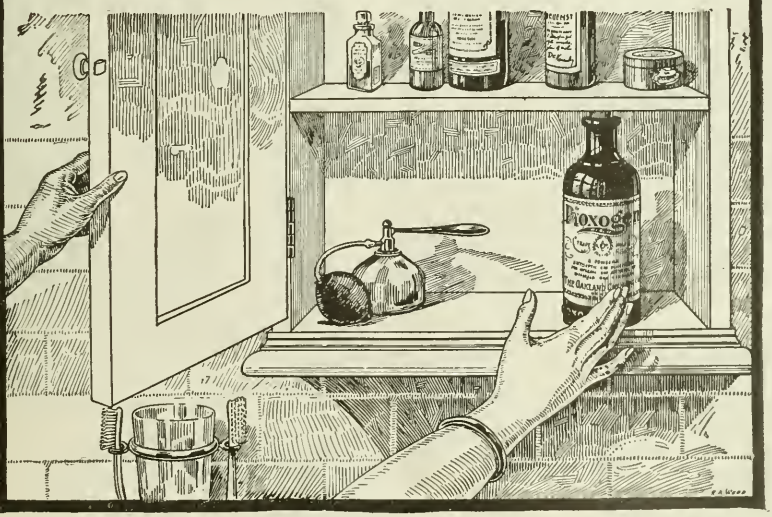

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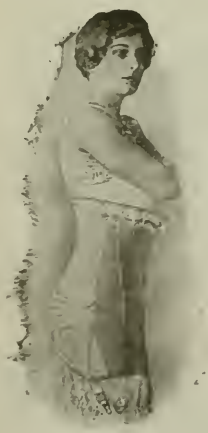

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